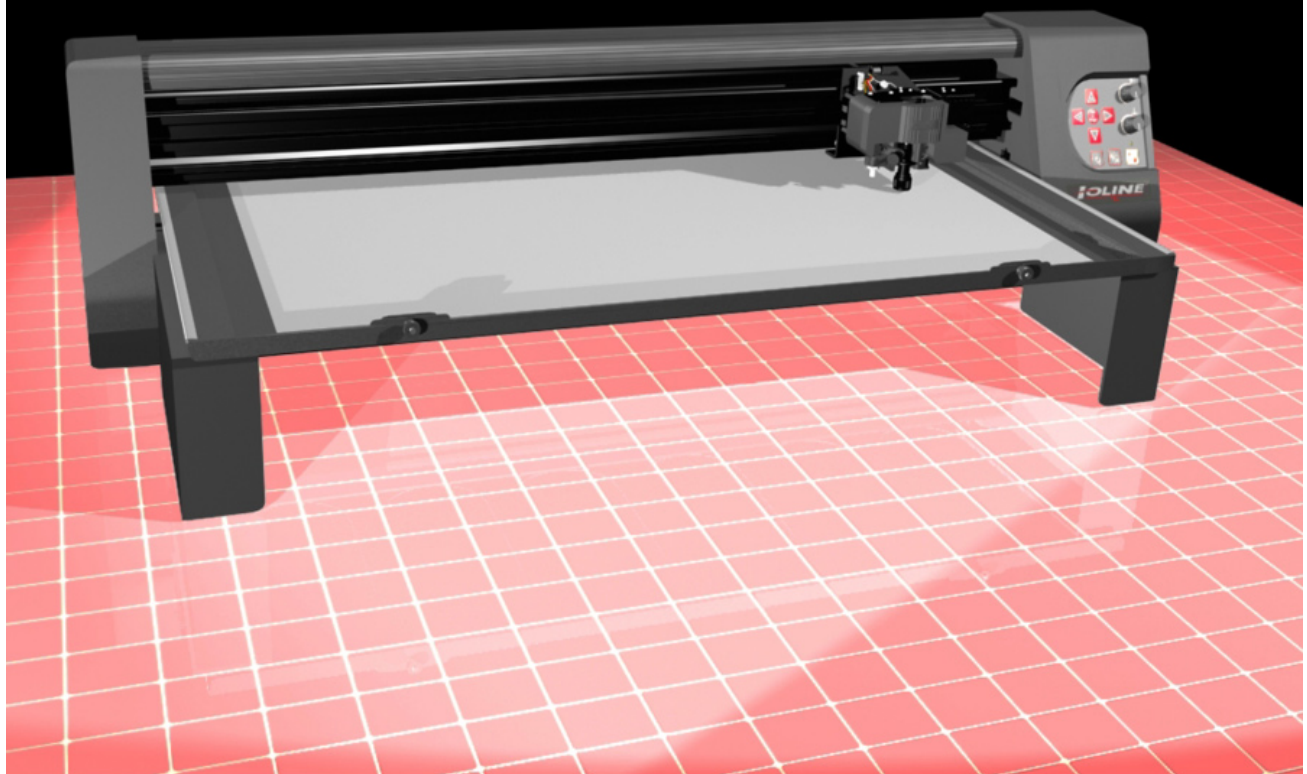


IOLINE

CORPORATION

300 System Cutter



Service Manual



This is the first edition of the 300 System Service Manual. Subsequent updates or revisions will be announced on this page.

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Table of Contents

Chapter 1 Introduction and Overview	9
How To Use This Manual	10
Safety	11
Warnings And Cautions	11
Basic Safety Guidelines	11
Product Overview	12
Specifications	13
How The 300 System Works	13
Table Movement:	14
Blade Movement:	15
Limit Of Liability Statement	16
Ioline Warranty Policy	16
Serial Number Identification	17
Glossary	17
Chapter 2 Nomenclature	18
Chapter 3 Setup & Operation	25
Keypad Controls	26
Arrow Keys	26
Set Origin	27
Cutting Speed	27
Blade Force	27
Start/Stop	27
Power LED	27
Test Cut	28
Repeat	28
Software Installation	29
Installing the 301, and Control Center Software	29
Windows 95/98/ME installation	30
Windows NT/2000 Installation	30
Installing the Hardlock Key	31
Using the 301 software	32

Control Center Software	36
Screen Options	36
Measurement Units	37
Acceleration	37
Up/Down Delays	37
HPGL Default	37
Send Settings to the 300	37
Force	38
Panel Size	38
Scale	38
Blade Overcut	38
Menu Bar Items	39
File	39
Send Cut/Plot File	39
Open Settings File	39
Save Settings As...	39
Setup	39
Plotter Setup	40
Com Port Setup	40
Display	40
Plotter Settings	40
Factory Defaults	40
ROM Version	40
Memory Buffer	40
Blade Holder Status	40
Motor Voltage	40
Options	41
Filtering	41
HPGL Setting...	41
Install New Firmware version	41
Calibration	42
Calibrate Plotter	42

Test	42
Serial Test	42
Computer Port Test.	42
Plotter Port Test.	42
Help	43
Contents	43
About	43
Chapter 4 Troubleshooting and Testing	44
Basic Operational Difficulties	45
Common Problems	45
Error Messages	46
Software Errors:.....	46
L.E.D Codes	47
No Power When The 300 System is Turned On	48
The 300 Won't Respond to the Computer	48
Communication Problems	48
Serial Communication Test:	49
Testing the 300 Plotter Port:	49
Testing the Computer Port:	49
Cutting Quality Problems	50
Mechanical, and Electronic Diagnostic Process	51
Expanded LED Codes	52
External Inspection	53
Required Tools:	53
Inspecting the Outside of the Unit:	53
Internal Cabling and Connection Inspection	54
Tools Required:	54
Initial Internal Inspection:	54
Testing the Power Supply	55
Tools Required:	55
Inspecting the Fuse and Output Terminals:	55
Testing the Power Supply Output Voltage:	55

Reference Information for the Power Supply Test Fixture:	56
Testing the Logic Board	57
Tools Required:	57
Testing the FETs (Transistors):	57
Testing and Replacing the Other Logic Components	58
Testing the Motors	58
Tools Required:	58
Initial Motor Inspection:	58
Likely Modes of Motor Failure:	58
Tray (X Axis) Motor Replacement:	58
Carriage (Y Axis) Transmission	59
Carriage (Y Axis) Motor Replacement:	59
Testing the New Motor:	59
Contacting Ioline Customer Service	60
Diagnostic Record	60
Re-Packing the 300	61
Chapter 5 Repair and Maintenance.....	62
List Of Recommended Tools And Equipment	63
Cleaning And Regular Maintenance	64
Cleaning the Traverse Extrusion and Carriage Wheels.....	64
General Disassembly Procedures.....	65
Removing the End Covers	65
Removing the Bottom Cover for Internal Access	67
Tools Required:	67
Y Axis Subsystem	69
CARRIAGE	69
Carriage Replacement:	69
Replacing the Carriage Ribbon Cable:	70
Y Axis Transmission	72
Y-Axis Transmission Replacement:	72
Y Axis Motor Replacement:	74
Y-Axis Belt Replacement:	75

X Axis Subsystem	77
X-Axis Transmission Assembly Replacement:	77
X Axis Motor Replacement:	78
Table Assembly Replacement.....	79
Power Supply.....	82
Power Supply Replacement	82
Rear Panel Replacement	83
Electronic Sub-Systems	84
Main Logic Board Replacement.....	84
Resetting the Factory Defaults	85
Keypad Replacement.....	85
Installing new Firmware	86
Chapter 6 Drawings, and Bulletins	87
Belt Tensioner ("Y" Axis)	88
Belt Tensioner (Bill of materials)	89
"Y" Axis Transmission	90
"Y" axis Transmission (Bill of Materials).....	91
Table Assembly	92
Table Assembly (Bill of Materials)	93
Tray Belt Idler Assy (Right Side).....	94
Tray Belt Idler Assembly - Right side (Bill of Materials)	95
Tray Belt Idler Assy (Left Side)	96
Tray Belt Idler Assembly - Left Side (Bill of Materials)	97
Carriage Assembly	98
Carriage Assembly (Bill of Materials)	99
Shaft Assembly	100
Shaft Assembly (Bill of Materials)	101
System 300 Chassis Assembly	102
System 300 - Chassis Assembly (Bill of Materials)	103
System 300 - Chassis Assembly (Bill of Materials) Cont... ..	104
System 300 Wrapping Procedure	105
System 300 - Wrapping Procedure (Bill of Materials).....	106

System 300 Boxing procedure	107
System 300 - Boxing Procedure (Bill of Materials)	108
Service Bulletins	109
Installation Error/301 Software	109
Creating Barudin Files/301 Software	110
Run Time Error Codes/301 Software	110
Stitches Overlap to Wrong Side / 301 Software	110
How to "KISS-CUT"	111



Chapter 1 Introduction and Overview

Chapter One provides an overview of the Service Manual and important background information about the 300 System Cutter. The following information is covered here:

- How to Use This Manual
- Safety
- Product Overview
- Limit of Liability Statement
- Ioline Warranty Policy
- Serial Number Identification
- Glossary

How To Use This Manual

This Service Manual explains most aspects of the Ioline 300 System Cutter including product specifications, installation directions, and testing and repair procedures.

Chapter 1 of the manual provides introductory information and general specifications.

Chapter 2 provides descriptive drawings showing part names for the 300 System cutter. This section is intended to supplement the *300 System User's Guide*.

Chapter 3 familiarizes the user with how the 300 System operates and how to use the software to maximum benefit. This section also supplements the *300 System User's Guide*.

Chapter 4 is a troubleshooting and testing guide.

Chapter 5 provides details for repair and maintenance of the 300 System.

Appendix sections contain technical drawings and reference material.

Safety

Warnings And Cautions

Please read the safety guidelines that are explained below before beginning the testing and replacement procedures explained in chapters 5 and 6.

WARNING

Warnings call attention to safety procedures that must be followed in order to avoid potential personal injury.



Cautions call attention to procedures that are required to maximize equipment performance.

Basic Safety Guidelines

Comply with the following safety guidelines in order to prevent electrical shock and other injuries.

- Only qualified service personnel should attempt any of the subsystem testing or replacement procedures that are described in this manual.
- Unless otherwise noted, all subsystem testing or replacement procedures must be performed with the 300 System turned off and the power cord removed from the rear panel. This will avoid the possibility of electrical shock.
- Before beginning any subsystem testing or replacement procedure, make sure that the 300 System is on a flat, stable, clean, and dry surface.
- Keep fingers, hair, and clothing well clear of the 300 System whenever moving parts are being tested.
- When working on electronic components use a grounding wrist strap to prevent electrostatic damage. If a wrist strap is not available Ioline can provide one.

Product Overview

The Ioline 300 System Cutter can handle many different plotting, and cutting operations up to 30 inches wide and 18 inches long. Three industry standard plotter languages (HPGL 7475, HPGL 7596, and DMPL) are supported. It is most commonly used in conjunction with the Ioline 301 software for cutting applique patterns, and producing embroidery stitch files for those appliques to be output to the most common embroidery machines. The 300 System also comes with Control Center software that allows adjustment of a variety of cutter settings from the computer.



Figure 1-1. Ioline 300 System Cutter.

Specifications

Plotting Speed	24 in/second
Max Plotting Acceleration	1.0 g
Blade Force	10g to 700g
Cutting Area	18.25" x 30.25" (.463m x .768m)
Scale	1% to 999%
Pens / Tools	Accommodates Markers, Pens, Pencils to 22.2mm (.875"). Minimum size: .30" (7.6mm)
Power Requirement	90-264 VAC, 47-66 Hz, 200 or 300 Watts
Overall Physical Dimensions	Height: 12" (.30m) Width: 24" (.61m) Depth: 45" (1.14m)
Shipping Weight	124 lbs (56 Kgs)
Environmental Range	Temperature: 0-35 C (32-95 F) Relative Humidity: 30% 85% (Non-Condensing)
Hardware Interface	Standard RS-232C Serial interface:9600, Baud rate, No parity, 8 Data bits, 1 stop bit Hardware or Software (XON / XOFF) Handshaking, DB-25S connector, requires. DB-25P mating connector. Parallel communication: IEEE-1284
Command Languages	DM/PL, HP/GL: HP-7475 & HP-7596

How The 300 System Works

The 300 System combines media and Blade motion to create vector cuts. Vector files are sent to the cutter via a serial or parallel connection with a computer or file server. When a file is sent to the cutter the electronic logic system translates the vectors into instructions for the X Axis (material motion) and Y Axis (Blade motion) motors.

Table Movement:

Tray motion is accomplished by mounting the material to be cut on an adhesive sheet that is mounted to a removable tray. The tray is then fastened to a fixed table on the machine. The X-Axis transmission rotates a shaft which in turn rotates a gear assembly. Belts on the right and left underside of the fixed table wraps around the gear assembly which in turn moves the fixed table in and out.

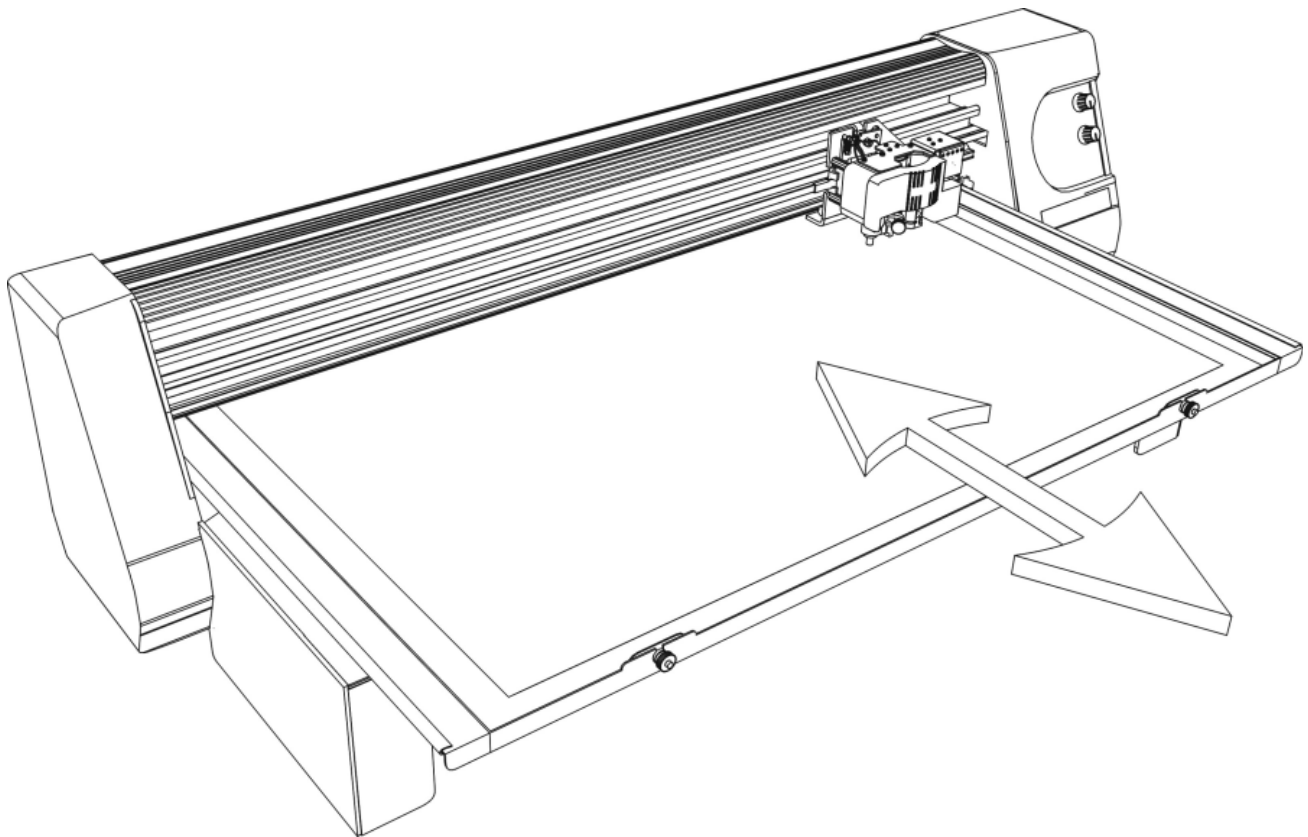


Fig. 1-2 Table (X Axis) Motion

Blade Movement:

The Y-Axis transmission powers a timing belt that transports a V wheel carriage along the Y-Axis traverse extrusion. The Blade is attached to the carriage and is made to contact the material by actuating a voice coil. When not cutting the Blade is held above the paper by spring action.

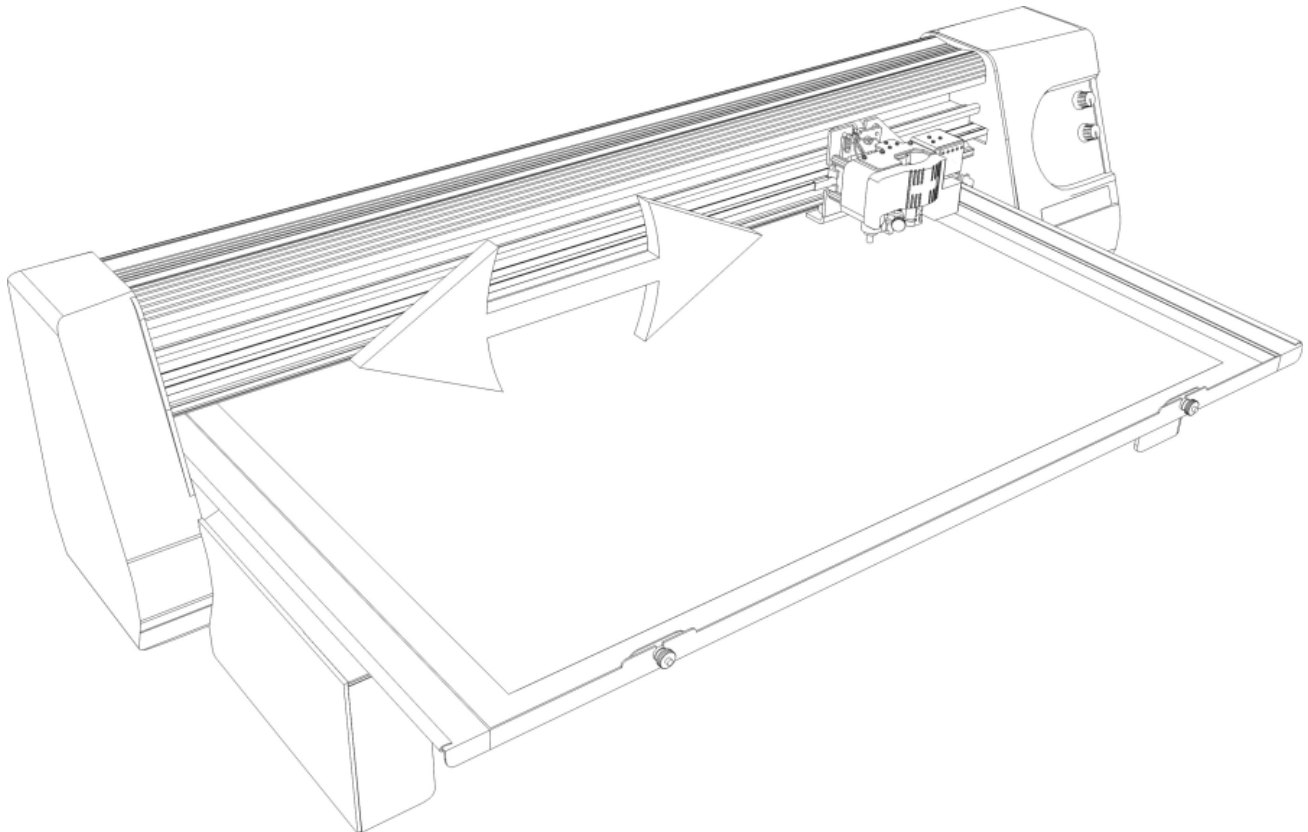


Fig. 1-3 Carriage (Y Axis) Motion

Limit Of Liability Statement

It is the responsibility of the operator to monitor the performance of the 300 system and maintain it in proper working condition by following the operating and regular maintenance instructions. It is also the responsibility of the operator to follow all safety precautions and warnings that are described in this manual. Ioline is not responsible for injuries that may occur as a result of unsafe operating procedures or for degraded performances as a result of failure to maintain the 300 System.

This Service Manual is provided for informational purposes only. The contents are subject to change without notice and Ioline Corporation assumes no responsibility for any errors that may be contained herein. No part of this Service Manual may be copied, disseminated, or distributed without the express written consent of Ioline Corporation.

Ioline Warranty Policy

Ioline Corporation provides a 12 month parts and labor warranty on all new equipment and 90 days on repaired units, unless specifically noted otherwise. Every unit is recorded by serial number when it leaves the factory. The warranty period is based on the serial number of the unit and extends from the date of manufacture up to 12 months, plus an extra 3 months for self life. Making the total warranty period 15 months from the date of manufacture. *See Fig. 1-4 on page 17 for an explanation of how to read the serial number of the machine.*

For warranty service, the end user must work through their dealer. Ioline Customer Service is available to assist Authorized Dealers in the performance of their equipment support.

Serial Number Identification

Identification of Ioline Corporation products is accomplished by use of a serial number located on the back of the plotter (See fig. 2-2 on Pg 17). You can determine the model and date of manufacture by interpreting this serial number.

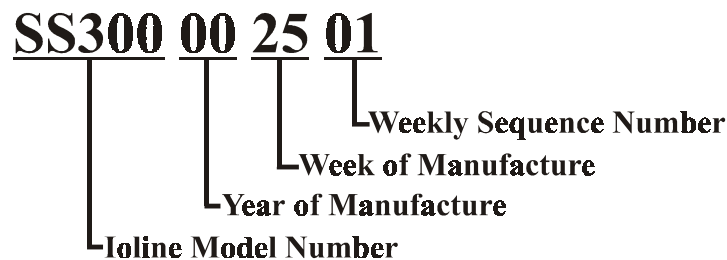


Figure 1-4. Ioline Serial Number Indications.

Glossary

1. BOM	Bill(s) of materials for an assembly
2. BOTTOM PAN	Metal housing protecting the underside of the cutter.
3. CARRIAGE	The component that holds the knife. It travels along the Y-Axis on the traverse assembly.
4. KEYPAD	Where the user controls simple plotter functions. Carriage and media motion is accessible from here during stop mode.
5. TRAVERSE ASSEMBLY	Structure that supports and guides the carriage.
6. X-AXIS	Direction of tray moving in and out of the machine.
7. Y-AXIS	Direction of knife motion. Usually associated with the carriage.



Chapter 2 Nomenclature

Nomenclature

(Defining the different parts of the 300 System)

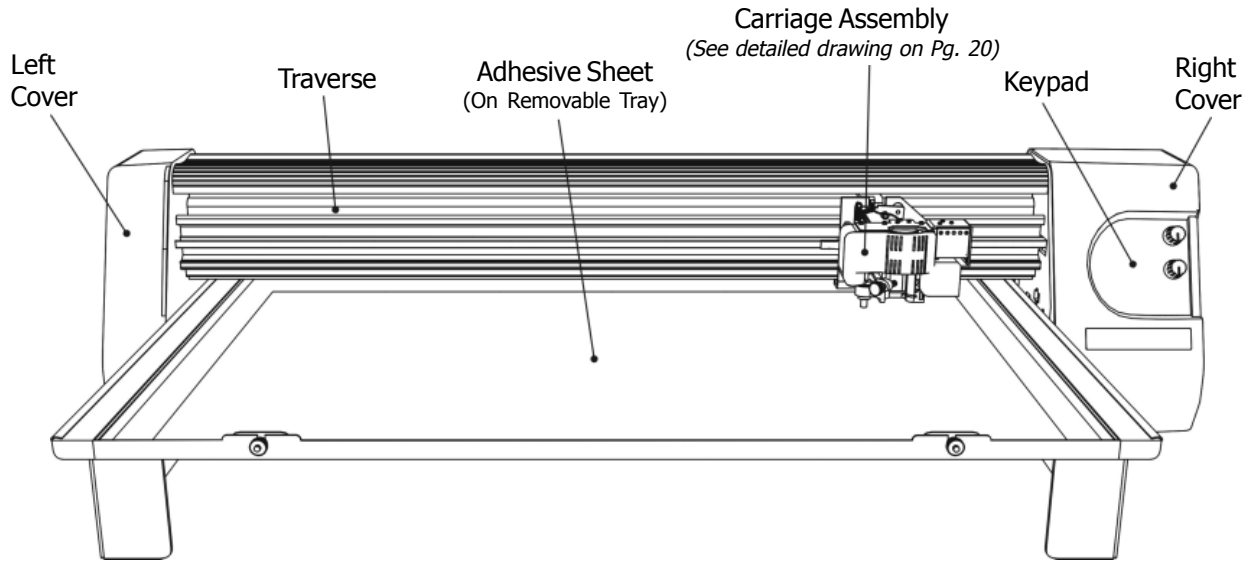


Figure 2-1. 300 System (With Removable Tray) Front View

Serial Number Plate

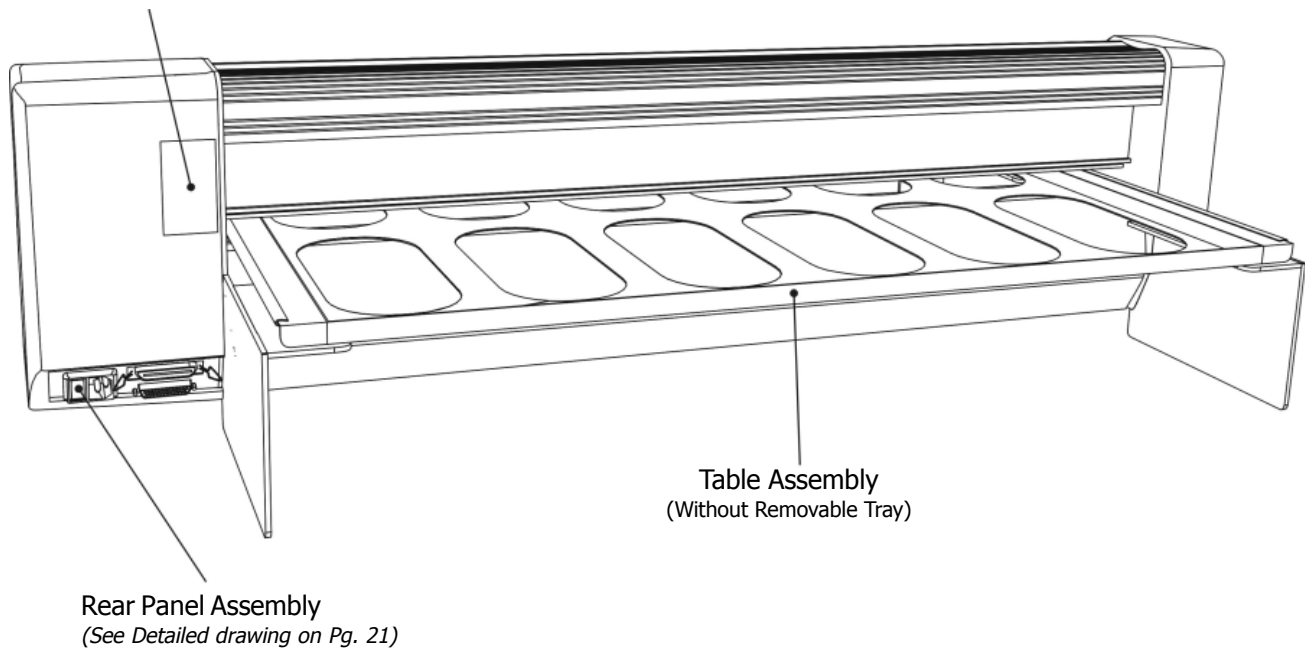


Figure 2-2. 300 System (Without Removable Tray) Rear View

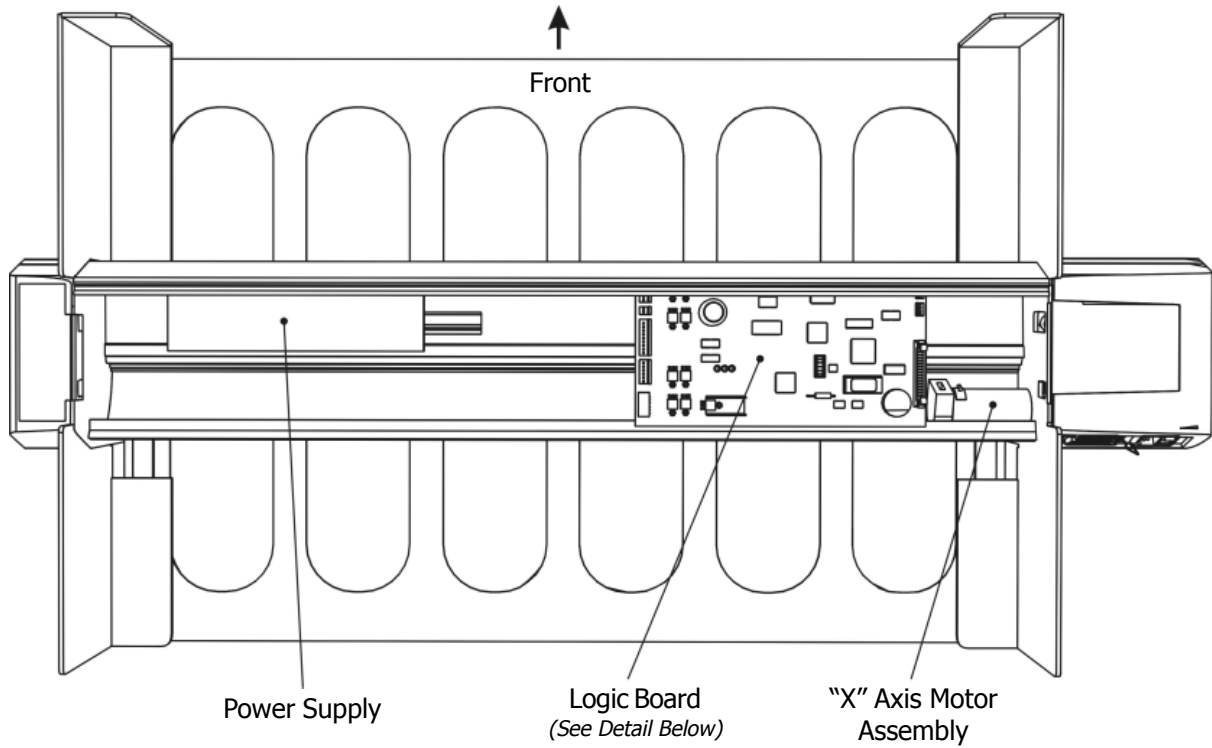


Fig 2-3 300 Cutter (Bottom View with bottom cover removed)

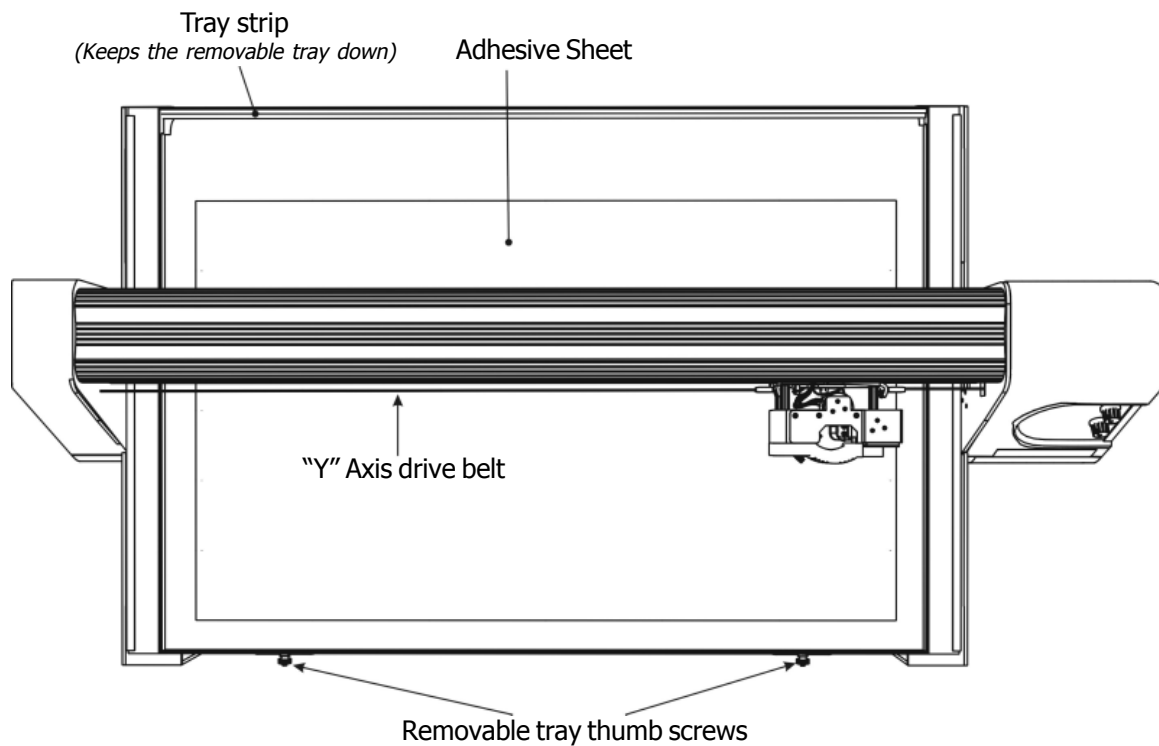


Fig 2-4 300 Cutter (Top View)

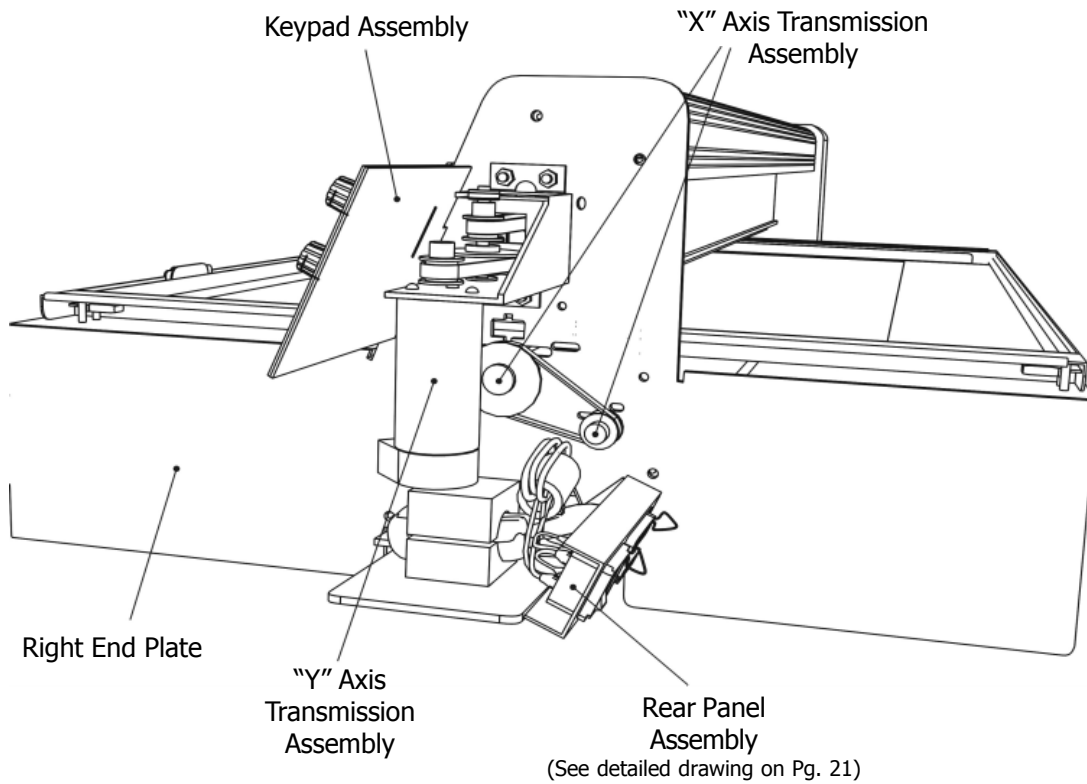


Fig. 2-5 300 Cutter (Right view with cover removed)

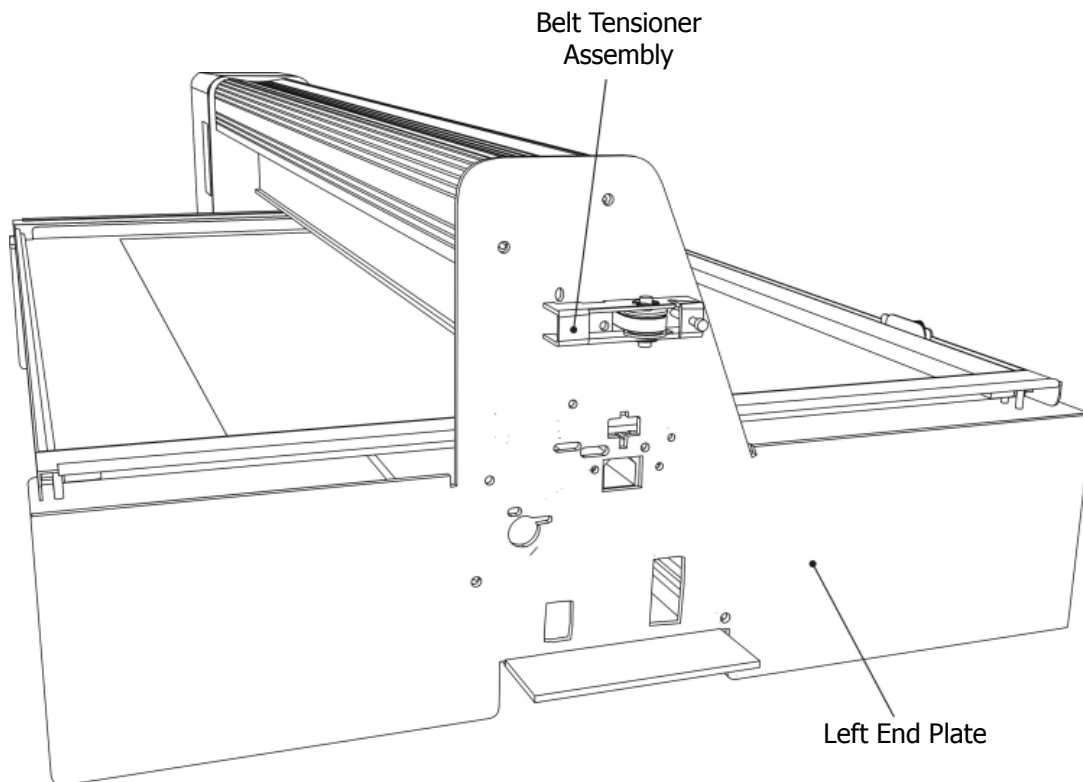


Fig. 2-6 300 Cutter (Left view with cover removed)

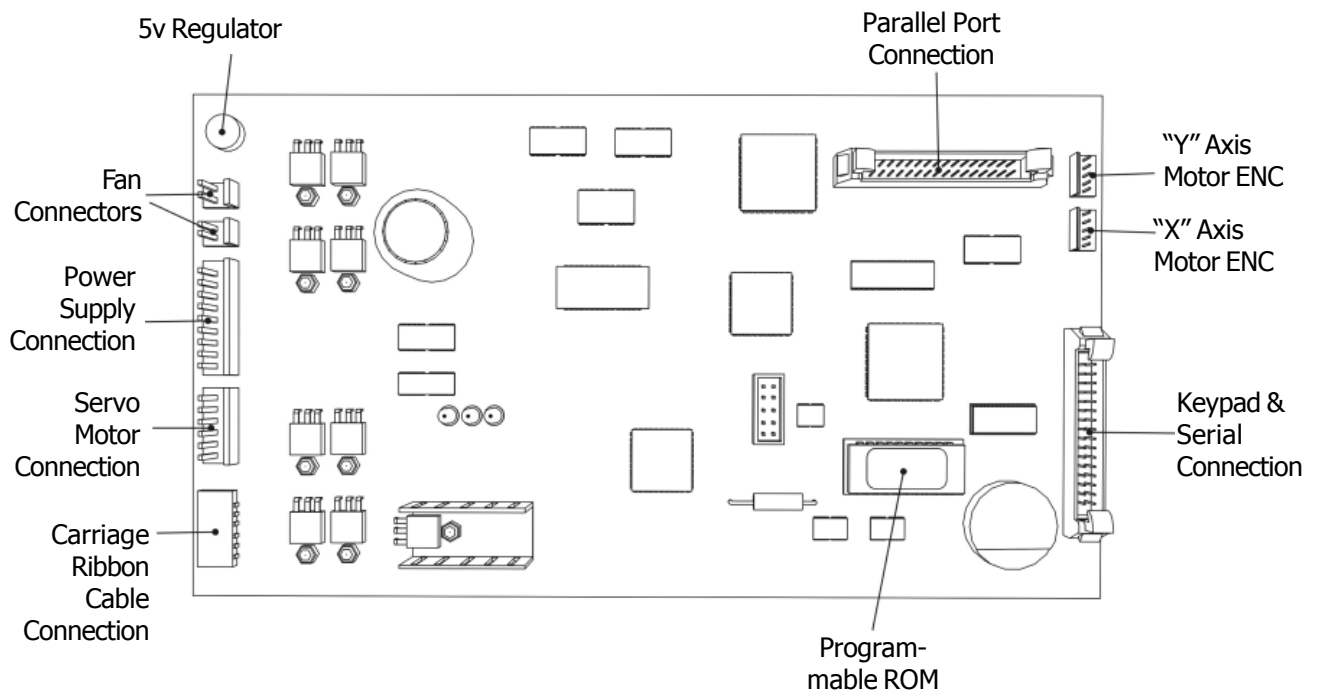


Fig. 2-7 Logic Board

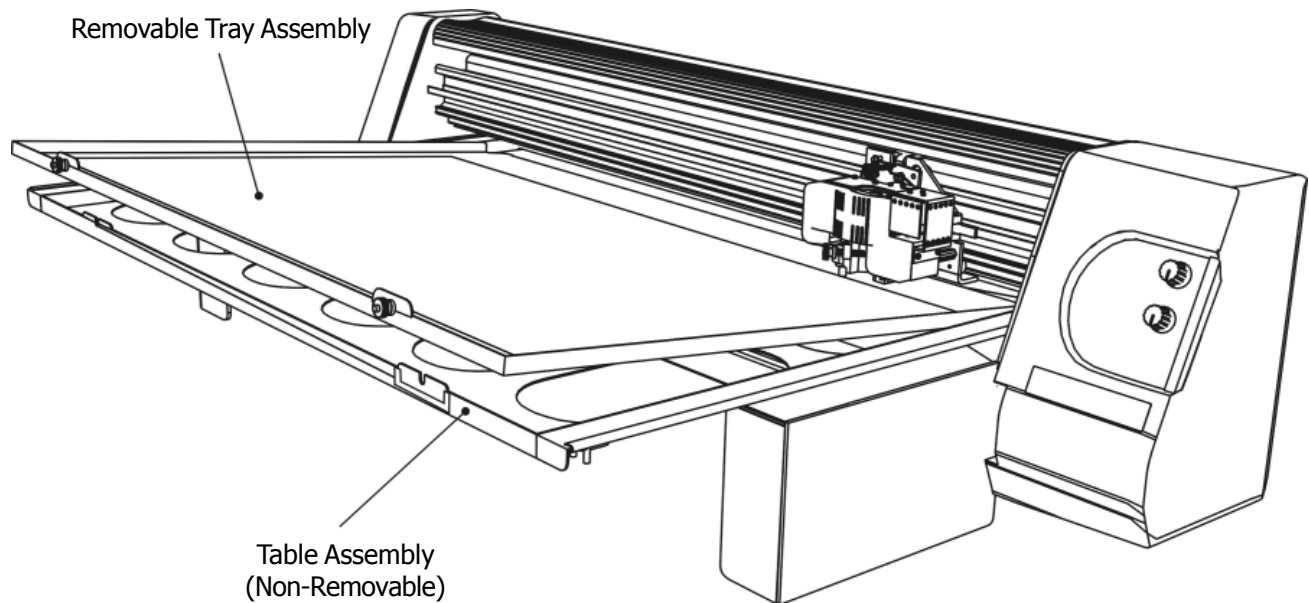


Fig. 2-8 Tray & Table Assembly

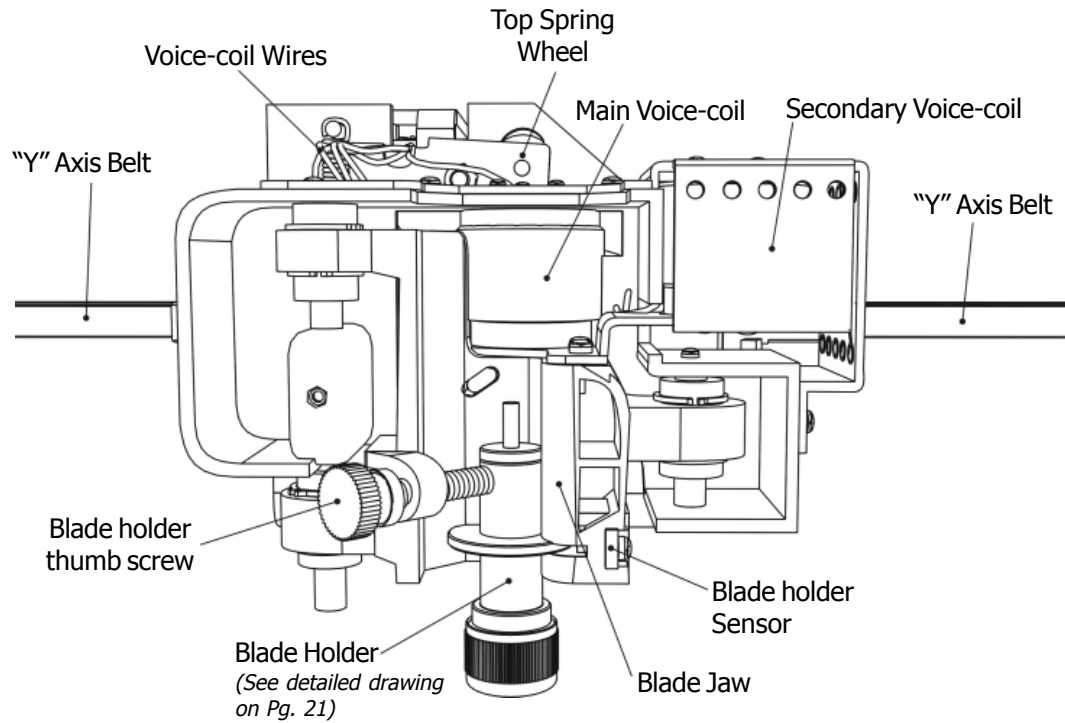


Fig. 2-9 Carriage Assembly (With Blade installed)

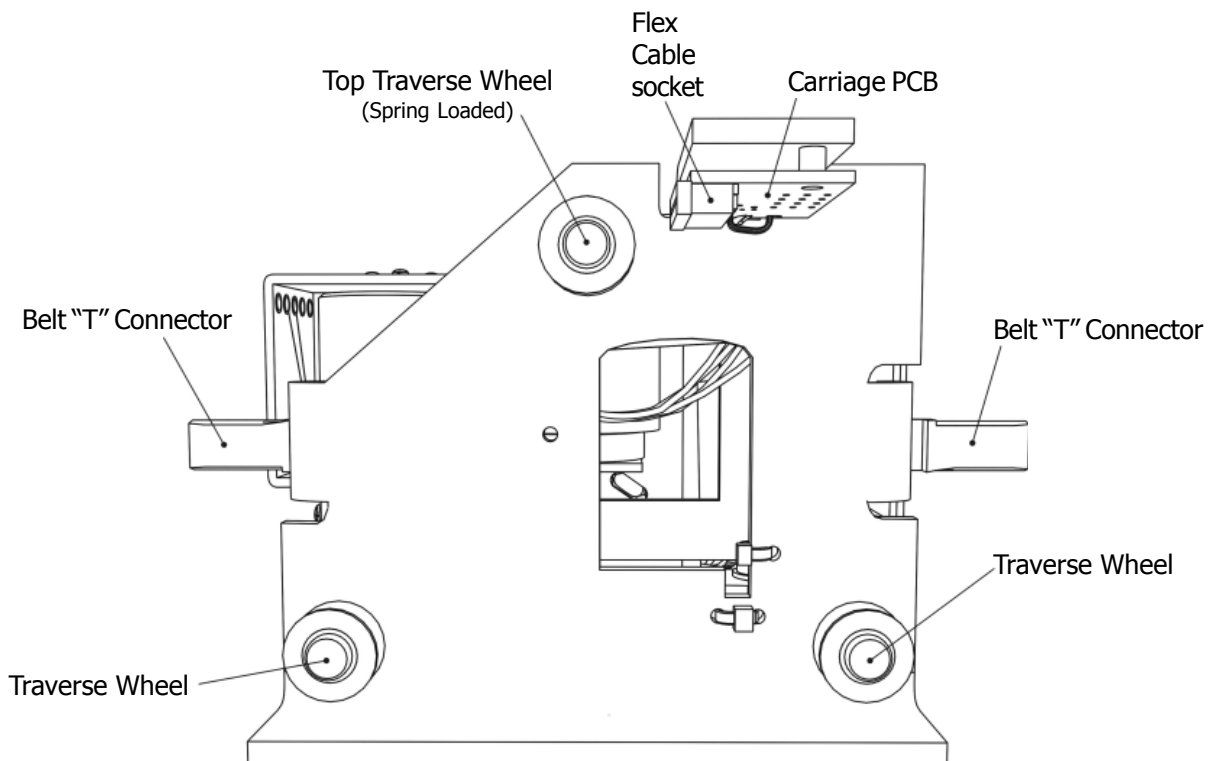


Fig. 2-10 Carriage Assembly (Rear View)

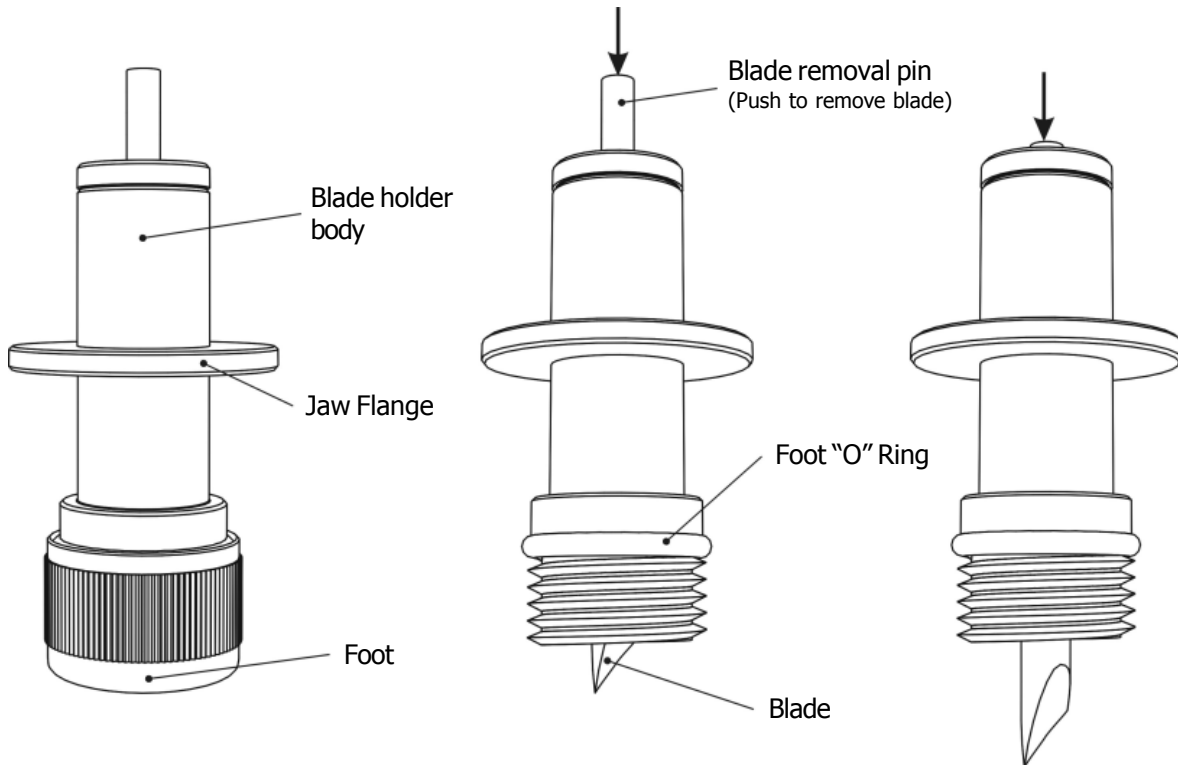


Fig. 2-11 Blade Holder Assy 1) With foot 2) With foot removed 3) Removing blade

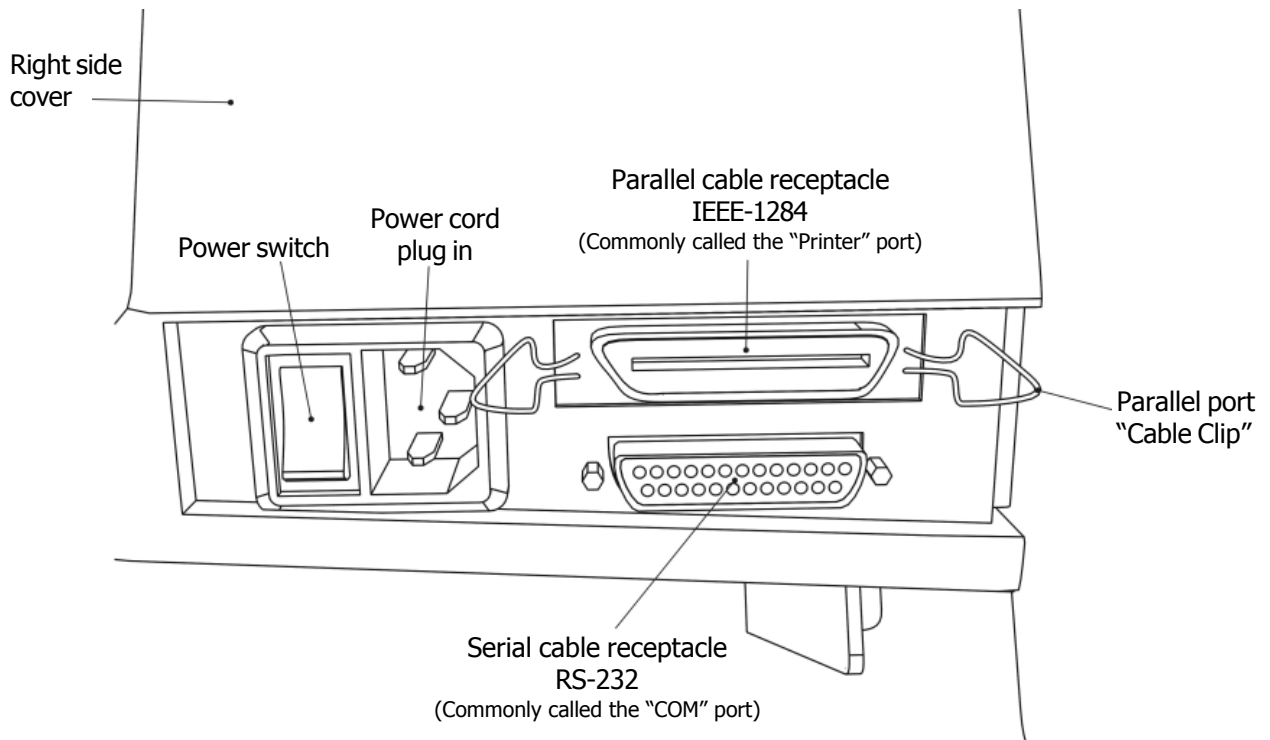


Fig. 2-12 Rear Panel Assembly



Chapter 3 Setup & Operation

This section contains guidelines for basic operation of the 300 System Cutter. The following primary topics are explained and illustrated:

- 300 Keypad Controls
- 301 Software Screen Options
- 301 Software Menu Items
- Control Center Screen Options
- Control Center Menu Items

Keypad Controls

The keypad on the 300 provides control of the motion systems on the cutter as well as access to speed, and force control. Blade depth can be adjusted by using the “Test-Cut” button, and repeatability is performed by pressing the repeat button. Communication can also be interrupted and restored and the initial plotting point can be set from the keypad.

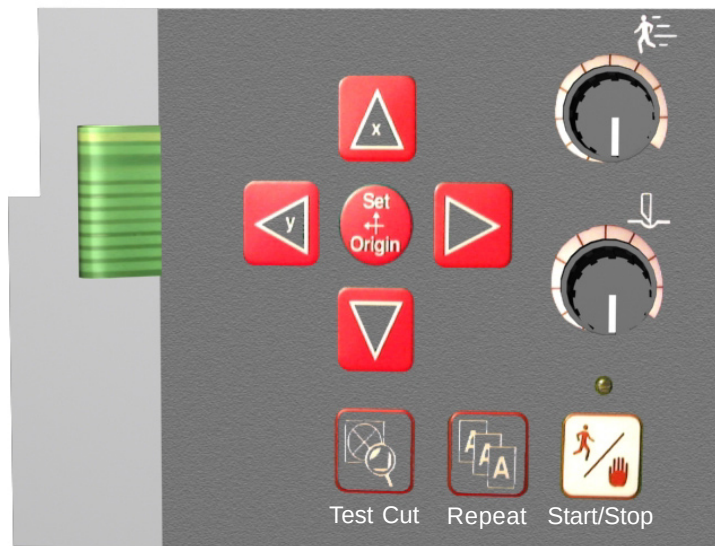


Fig. 3-1 The 300 Keypad

Arrow Keys

The arrow keys control paper (vertical arrows “X”) and Blade carriage (horizontal arrows “Y”) movement within the parameters of the 300’s frame setting. The plotter must be in stop mode (red LED) to use the keypad arrow keys. The Blade and media speeds become greater the longer the key is depressed. The Blade carriage has a safety feature that will not allow it to collide with the end plates. The tray will not allow forward motion outside of the frame during cutting operations. Diagonal motion is possible by pressing a vertical and horizontal arrow key simultaneously.

Set Origin

You have to set an origin point before sending a cut file to the 300. When the Set Origin key is pressed the plotter logic will use the current X-Axis position of the tray, and Y-Axis position of the Blade carriage as the starting point of the next plot. When the Set Origin key is pressed the LED will turn green and the 300 will accept a plot file.

Cutting Speed

You can set the speed of cutting by adjusting the knob on the keypad. If the knob is put in the “Minimum” position (6:00), this puts the cutter in “Crawl Mode” which allows the blade to move very slowly for precise positioning. Different materials require different speeds for cutting accuracy, and correct depth. For more information, see *Chapter 4: Cutting quality problems*.

Blade Force

You can set the Blade force by using the knob on the keypad. The minimum value (10 Grams) and maximum value (175 Grams) of the available force can be set from the 300 Control Center if you are plotting with a pen. If you are using a blade, then the force is set at 700 grams, and is not adjustable from the control center software. Material type and thickness determines the correct force setting range on the keypad force knob.

Start/Stop

The Start/Stop key controls serial or parallel communication between the plotter and the computer. When the communication line is open the LED will be green (Start mode). The LED turns red when communication is stopped (Stop mode). Plot files, and Control Center settings can only be sent to the cutter when communication line is open (green LED).

Power LED

The light emitting diode (LED) immediately above the Start/Stop switch indicates the state of communication and provides error codes. LED error codes can be found in *Chapter 4* in the *LED Codes* section. The LED is red after power is turned on and the carriage resets. A red LED also indicates that the communication line is interrupted between the cutter and the computer. When communication is open between the cutter and the computer the LED will be green.

Test Cut

Pressing Test Cut on the keypad will cut a small square with a circle cut into 4 pie pieces (See drawing below). This internal cut is designed for adjusting the correct blade depth on the blade holder. For a diagram showing correct blade depth, see the 300 User's Guide under "Setting up the blade". Pressing the test cut key for approximately 2-3 seconds will cut the Ioline logo. This is designed as a further test to see how the blade is cutting with more complex shapes, and letters.

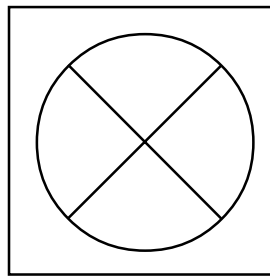


Fig. 3-2 Test Cut

Repeat

The repeat button serves two purposes.

- 1) To repeat the same cut over and over again on a new piece of material without having to re-send the file from the computer.
- 2) To repeat the same cut on the same piece of material if the material is hard to cut such as Leather, or Felt.

When a file is sent to the 300 to be cut, the file is stored in the memory buffer of the 300 system cutter. After loading the tray with a new piece of material, press the "Start/Stop" button so the keypad light is "Red". After setting the blade in the starting position, you can press the repeat button. The same file will then cut out on the new piece of material without having to re-send the cut file from the computer. Note: It is only necessary to press the "Star/Stop" button after sending the file from the computer. Pressing the repeat button will leave the light red when it is finished.

If you are cutting "Hard to cut" material such as Leather, or Felt then the repeat button serves a valuable function. When the file is done cutting, press the "Start/Stop" button so the keypad light is "Red". Press the repeat button, and it will "Re-cut" the same file directly over the previous cut. This technique is good for thick material that doesn't cut right the first time, and may take several "Repeats" to cut through fully.

Software Installation

The Ioline 301 Embroidery software is a Microsoft Windows 95/98/ME/2000 compatible program that comes on a CD ROM disk with the cutter or is available online at www.ioline.com. A Macintosh version of the 301 software is not available. The 301 software will perform the following:

1. Import some of the most popular embroidery files including Tajima, Toyota, PLT, DXF, and Baraudan.
2. Export in some of the most popular file formats like Tajima, Toyota, PLT, DXF, and Baraudan.
3. Cut out multiple appliques in multiple layers.
4. Create multiple stitch files in multiple layers.
5. Stitch editor program for editing all facets of a stitch.
6. Design Setup window for easy shape duplication, rotation, and layer selection.

Installing the 301, and Control Center Software

The 301 software can use either a mouse or the keyboard of the computer to change the default plotter settings. If using the keyboard, note the following guidelines:

- Use the Tab key to cycle through the screen fields.
- Use the up/down cursor movement or numeric keypad keys to change a numeric value within a highlighted menu field.
- Use the Alt key to toggle between the screen fields and the pull down menus.

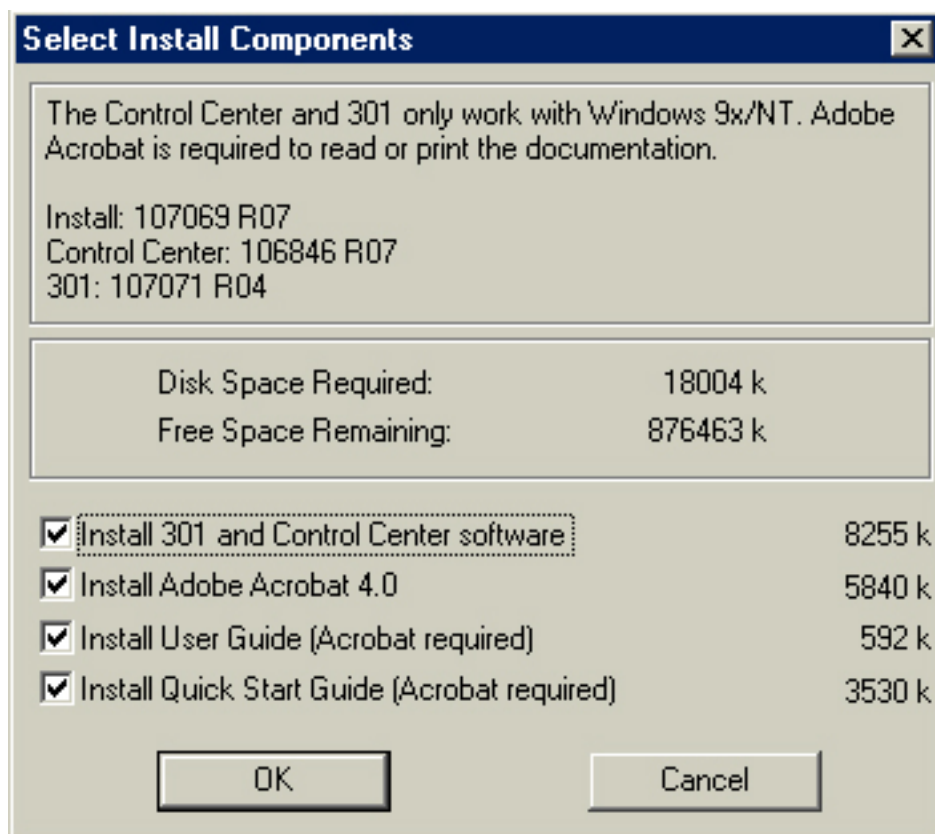


Fig. 3-3 301 and Control Center installation screen

- Use the Enter key to select a highlighted field when a pull down menu is open.

Windows 95/98/ME installation

1. Place the disk in your CD ROM drive.
 2. The CD should Autorun once it is placed in the drive, and the drive door is closed.
The install wizard will now start the installation process. Follow the prompts until the installation of the Ioline 301 and Control Center software is finished (*See Fig. 3-2 on the previous page*).
 3. If the CD does not Autorun, click on the “Start” button and then “Run”.
 4. In the Run window click on “Browse”, and select your CD ROM drive in the box labeled “Look in”.
 5. Select the file “IOSETUP.EXE”, and click “OK”.
 6. In the Run box, click “OK”.
- The install wizard will now start the installation process. Follow the prompts until the installation of the Ioline Control center is finished.

Windows NT/2000 Installation

Installation of the CD ROM is the same for Windows NT/2000 as for Windows 95/98/ME. The difference is in the “Hardlock Driver” (*See the next section “Installing the Hardlock”*). Windows 95/98/ME uses a different hardlock driver that will not work with Windows NT/2000. To obtain this driver go to www.ealaddin.com/hardlock/downloads.asp and download the file “HLDRV32.EXE”. This file is a self extracting file, so when the download is complete, “Run...” the file from the Run dialog box. After installation is complete, you can use the 301 software in Windows NT/2000. If you can not obtain this driver over the internet, contact Ioline Tech Support for a disk, or e-mailed file.

Installing the Hardlock Key

The Hardlock key is a device that allows you to use the 301 software (A common name for this device is a "Dongle"). Without it, the software will not work. The Hardlock key comes with the 300 system cutter in the accessory kit, and plugs into your computers *printer port*. (See drawing below)

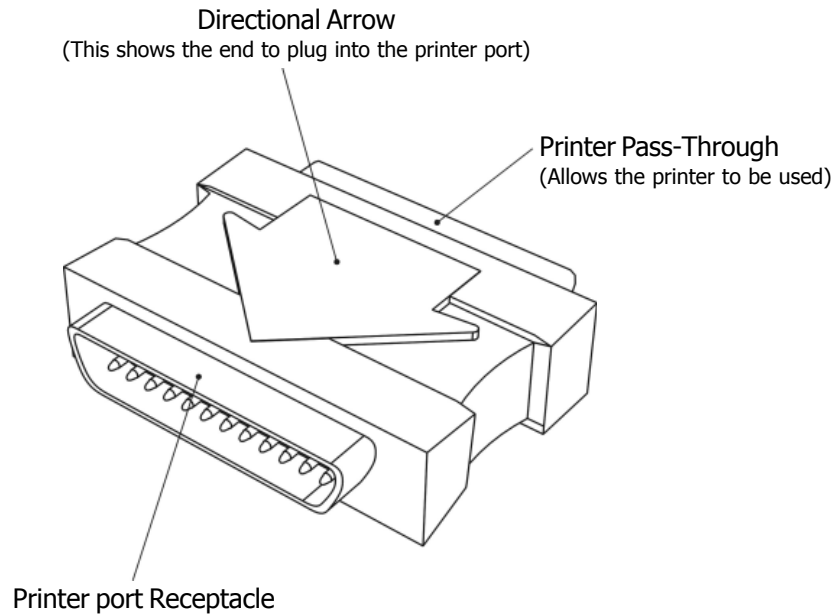


Fig. 3-4 301 Software Hardlock Key

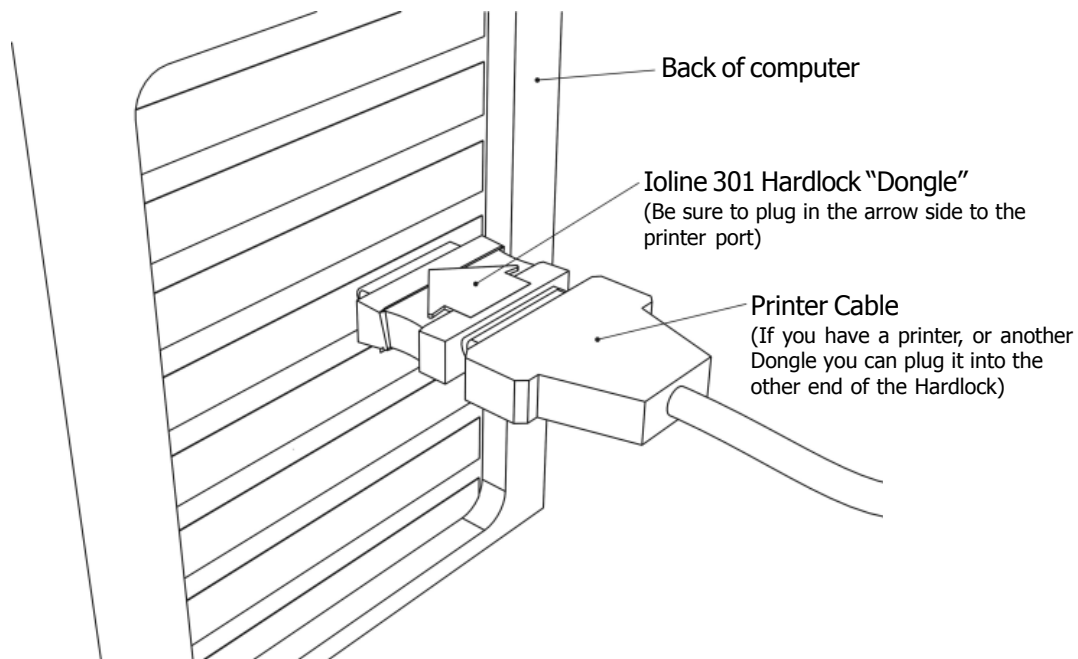


Fig. 3-5 Rear view of computer showing correct installation of the Hardlock and printer

Using the 301 software

The 301 software is very easy to use, and anyone can learn to use it in just a few minutes. The first thing to remember is that the 301 software is a tool to help you cut appliques, and create stitches for those pieces. It is not an "Automatic" process, so some learning on your behalf is required. The 301 software uses many different input file types such as Tajima (.DST), Melco (.EXP), Toyota (.10o), Barudan (.DAT), Autocad (.DXF), and Hewlet Packard (.PLT). These files can contain plot and stitch coordinates at the same time allowing you to create a stitch disk from another embroidery software package. The 301 software can import the file, and cut the applique piece or pieces out, while keeping the stitch file intact for your embroidery machine to sew.

Using the 301 software

1. Double click on the "301" icon on the desktop. (Seen below)



2. The first window to open is the main import screen. This window allows you to choose the type of file, and location of the file you wish to open.

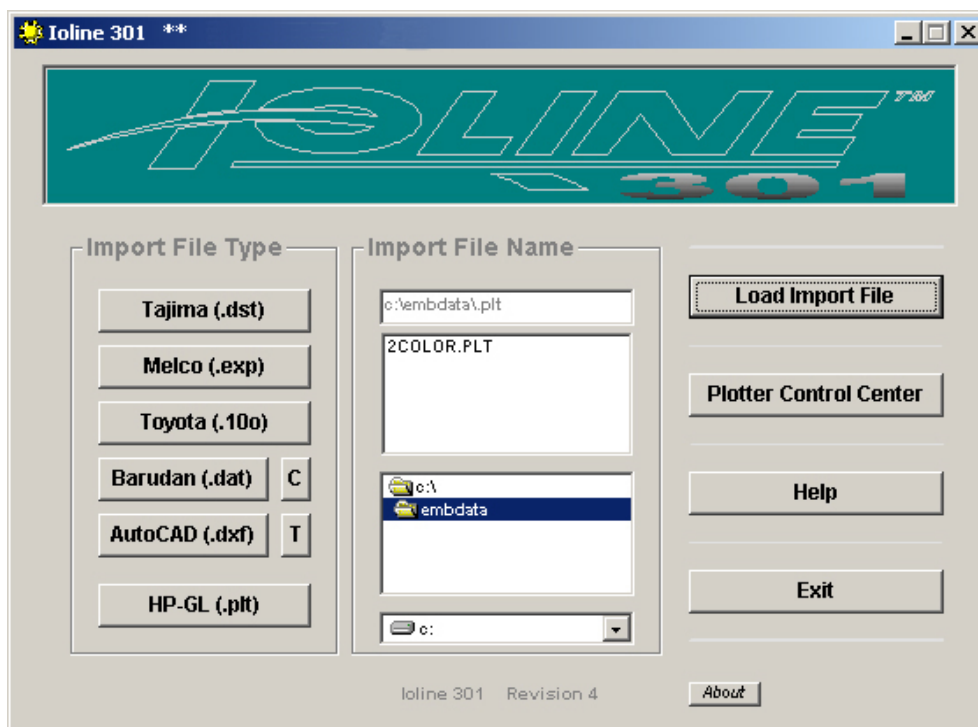


Fig. 3-6 301 Software Main Window

Select the type of file, and it's location, and click on "Load import file".

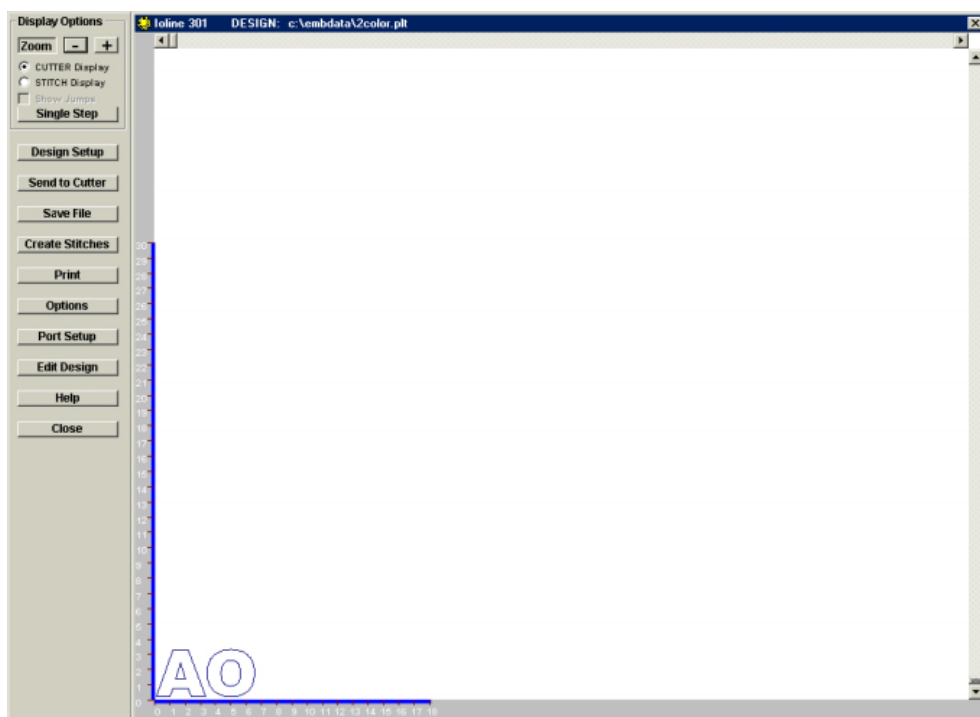


Fig. 3-7 301 design view

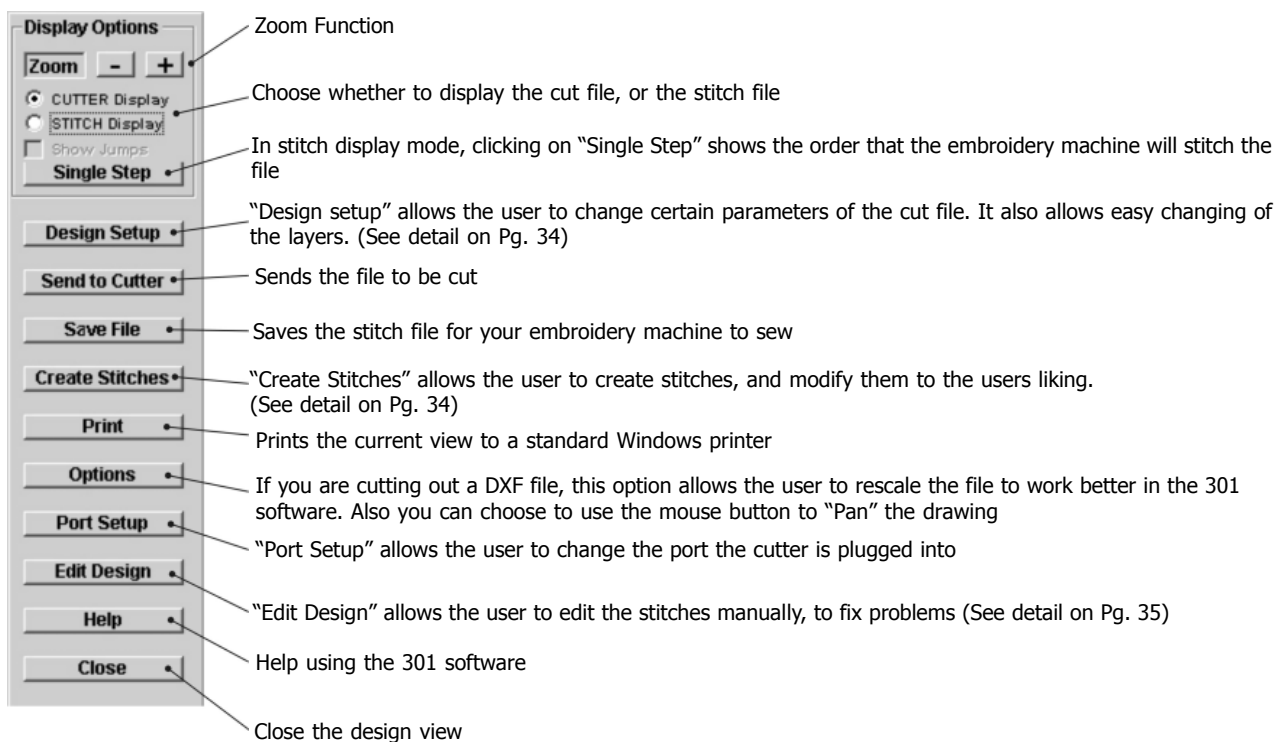


Fig. 3-8 301 Display Options buttons defined

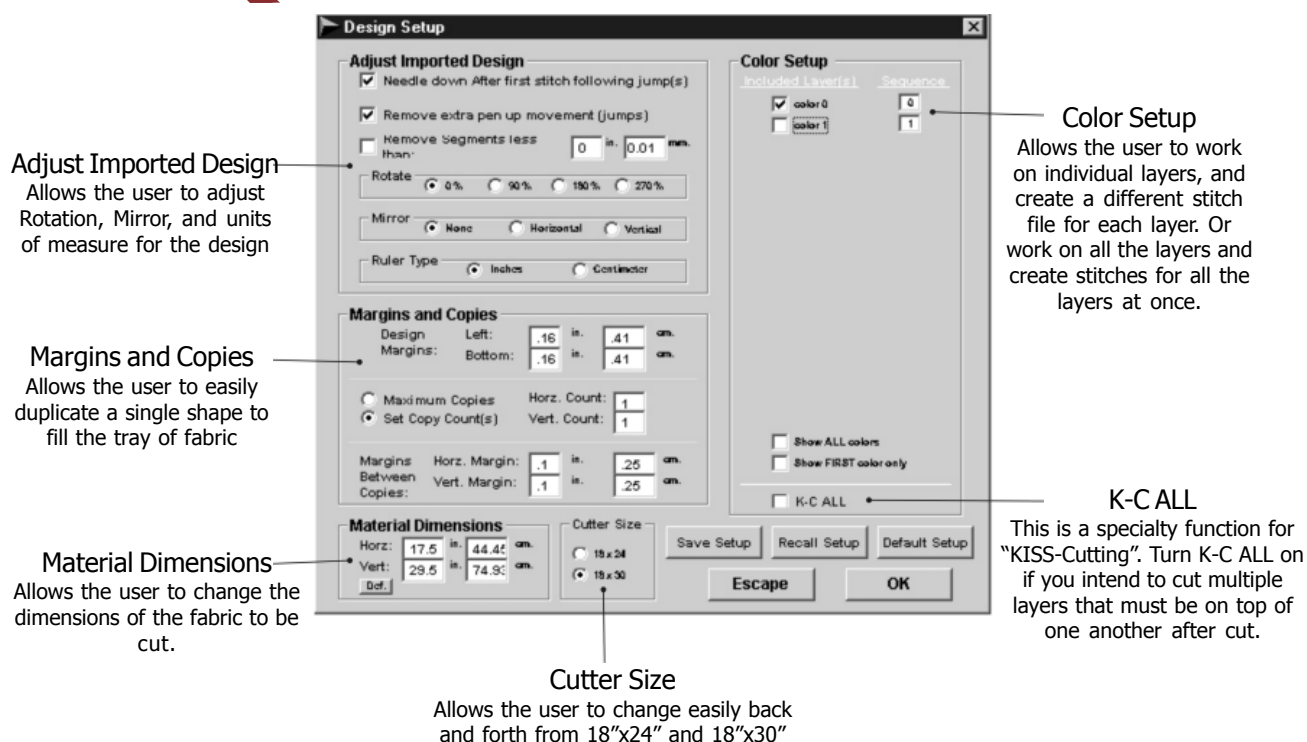


Fig. 3-9 Design setup window

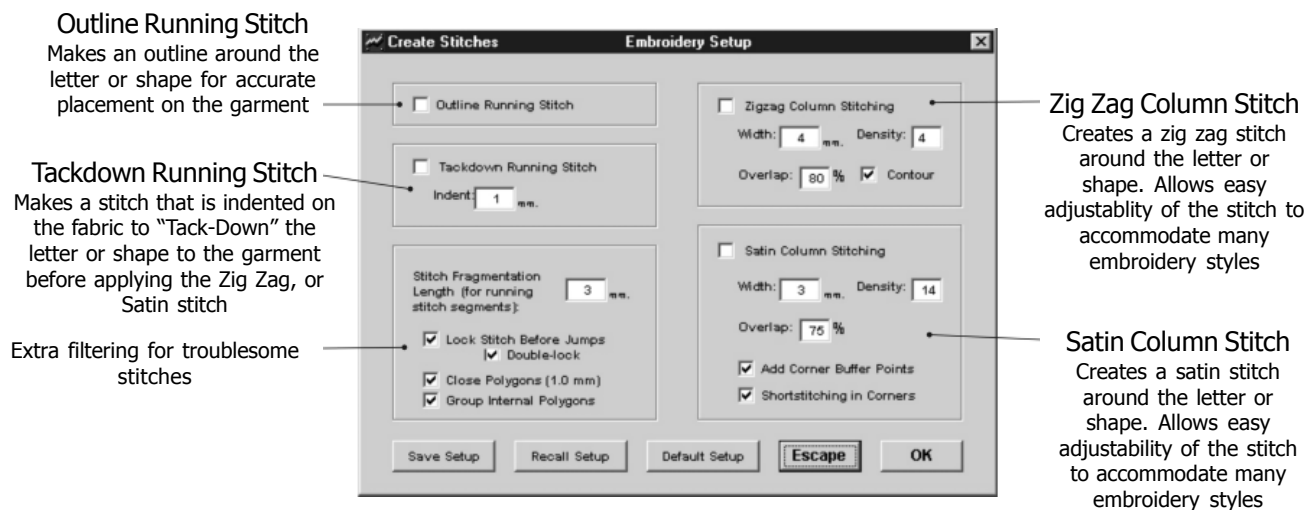


Fig. 3-10 Create Stitches Window (See below for the four types of stitches)

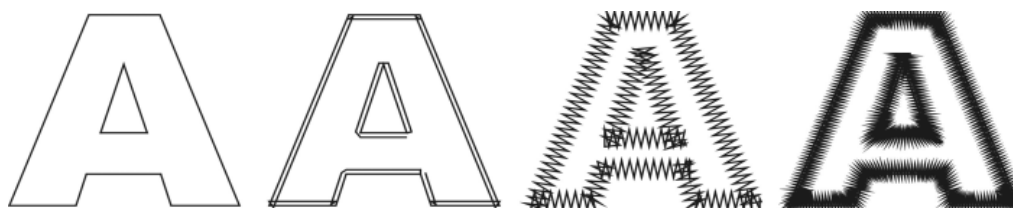


Fig. 3-11 1) Placement Stitch 2) Tackdown Stitch 3) Zig Zag Stitch 4) Satin Stitch

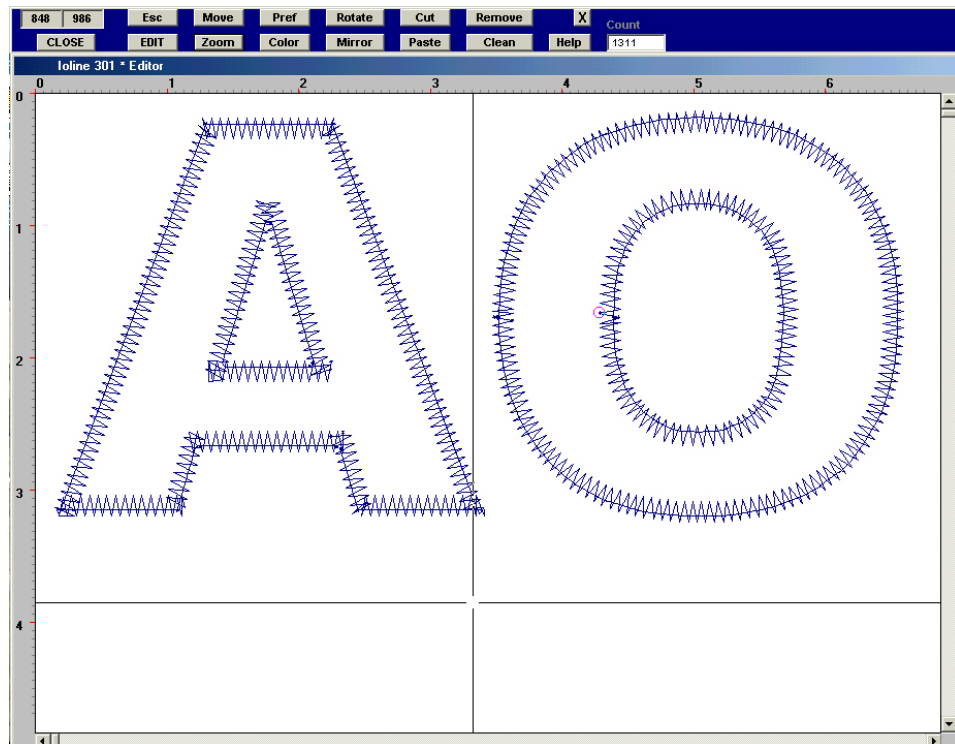


Fig. 3-12 Edit Design Window

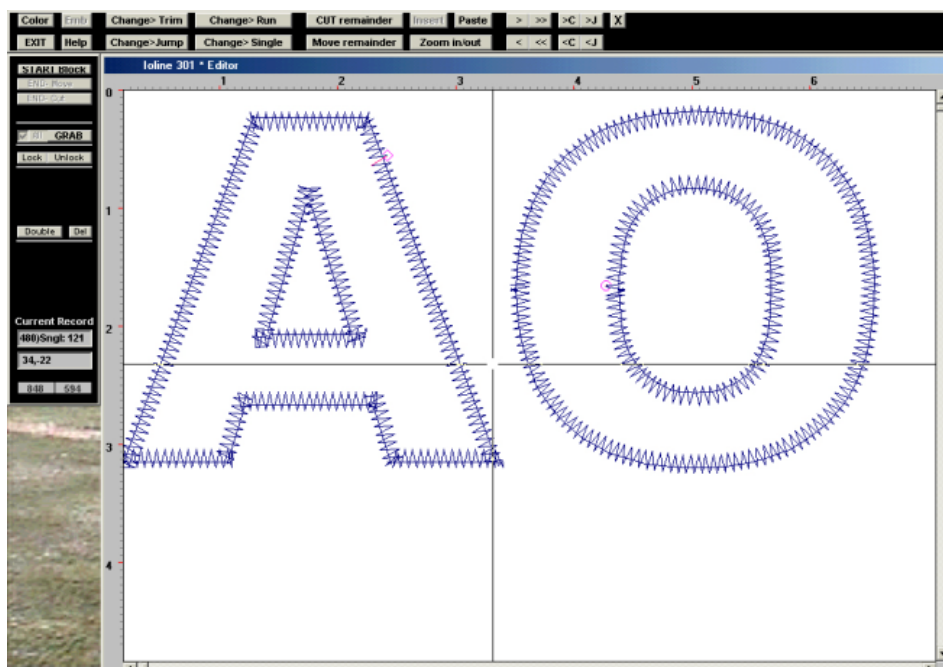


Fig. 3-13 Edit Stitches Window

Control Center Software

The Control Center Software provides an interface that allows detailed changes to the 300 cutting parameters.

Screen Options

The main Control Center screen provides control over the primary plotting parameters. Any changes that are made must be sent as temporary or permanent settings before they take effect. Press the Start/Stop key and make sure the green LED (Start mode) is on before attempting to send any changes to the plotter.

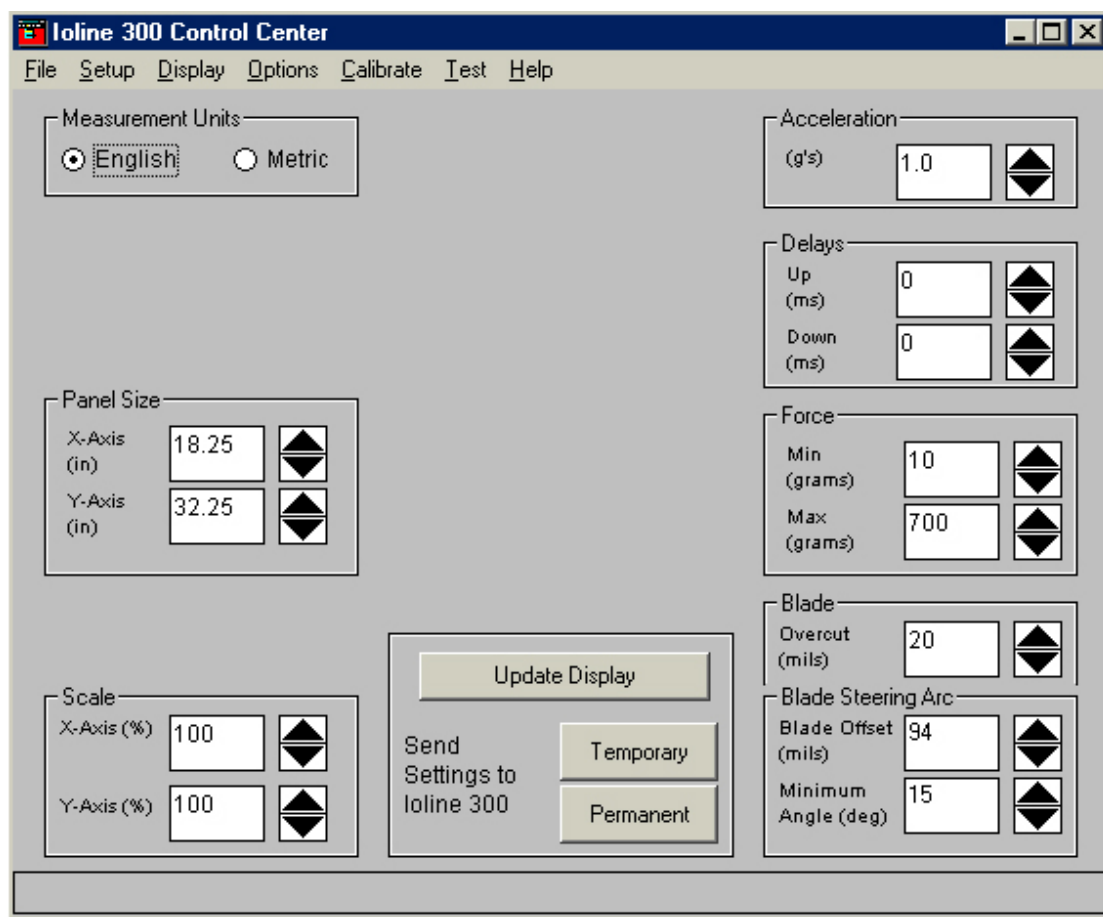


Fig. 3-14 Ioline Control Center Window

Measurement Units

English or Metric unit systems may be used for length and speed settings.

Acceleration

The acceleration setting determines how quickly the blade will change speed when starting or ending a line. The factory default acceleration setting is 1.0 g (1 g = 32.2 ft/s²). The setting range is 0.1 to 1.0 g.

Up/Down Delays

Up/down delay controls how long the blade hesitates when actuated. Zero delay makes the blade rise instantly when line drawing is finished. By default it takes the blade 6 milliseconds to lower onto the paper when the logic powers the voice coil. Longer blade delay settings make the Blade move more slowly but may improve the quality of the cut line. The setting range is 0 to 250 ms (milliseconds).

HPGL Default

Your 300 cutter supports three industry standard plotter languages; HPGL 7475, HPGL 7596, and DMPL. Your 300 will automatically switch between DMPL and HPGL. The plotter cannot distinguish between HPGL 7475 and HPGL 7596 so the version number must be set in Control Center before a plot file is sent.

HPGL stands for Hewlett Packard Graphics Language and DMPL stand for Digital Microprocessor Plotter Language. HPGL 7475 is the default plotting language and is most common in the industry. It has a lower left origin which means the 300 begins plotting from the lower left (keypad side) and measures everything from this location. HPGL 7596 uses a center origin and is much less common. A center origin means the 300 begins cutting from the center of the panel and measures everything from this location.

Send Settings to the 300

When changes are made in the screen dialog boxes the plotter logic has to be updated via the serial, or parallel link. Three options exist to make the changes take effect. Sending the settings with the Temporary button will replace the current plotter parameters until the power is turned off or new settings are sent from the control center. If the Permanent button is used to send the settings they remain in the plotter (even after the power is turned off) until they are changed from the Control Center. The update Display button displays the "Current" status of the cutter. If your unsure about the settings currently setup on the plotter, pressing the Update Display button will show you what they are.

Force

The Force settings control in the 300 Control Center is not adjustable when you are using a Blade. The ability to cut fabric takes a lot of grams of force, and therefore does not need adjusting.

Panel Size

The default panel size for the 300 System is 18.25" long by 32.25" wide. This size is the cutting area of the 300 cutter, and can not be set any bigger than the default size.

Scale

By default the 300 will produce a cut at 100% the size of the specified in the plot file (no scaling). If the X and Y scale is set to 50% the 300 will produce an applique that is half the specified size. You can set either or both the X and Y scaling of the plot from 1% to 999%.

Blade Overcut

Because of the angle of the blade, the machine must perform an Overcut to meet up with another line. If you picture dragging a stick in the sand behind you, the angle of the stick is the angle of the blade. Your body represents the center (or pivot) point of the blade, and the tip of the stick represents the tip of the blade. If you draw a box in the sand with your feet, it will look fine. But if you draw the same box with the stick behind you, the corners will be rounded. This is where the overcut comes in. It extends the tip of the blade past the corner point so it makes the corners square instead of rounded.

Blade Steering Arc

The blade steering arc is simply the rotational angle of the blade around a corner. If the blade is cutting a box, each corner is a 90 degree angle. In order for the angle to be cut right by an angled blade, the machine must perform a rotation around the 90 degree angle for it to look good. Typically the Blade Steering Arc is 30 degrees for a 45 degree blade, and 15 degrees for a 60 degree blade. These are good standards for cutting out most materials.

Menu Bar Items

The menu items along the top of the screen allow adjustment of a variety of settings for computer control of the Ioline plotter. File management, plotter setup and serial port testing can all be accessed from the menu bar.

File

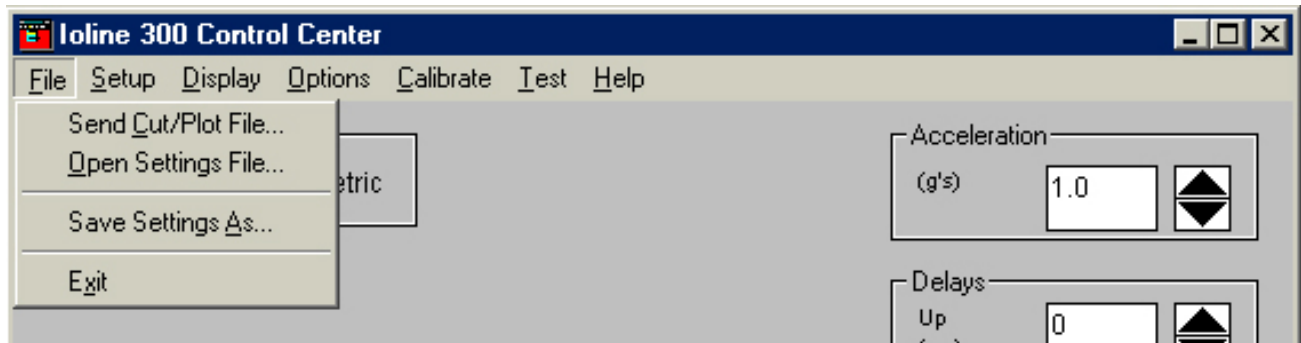


Fig. 3-15 File Menu

Send Cut/Plot File

Use this option to send plot files (.plt format) to the 300.

Open Settings File

Opens custom settings for the 300 that have been stored with the *Save Settings As...* option below. When the 300 is shut off these settings will be lost. The factory default settings will be in effect the next time the plotter is powered up.

Save Settings As...

Allows custom settings to be saved to a file so that they can be sent to the 300 at a later time. To retrieve these files use *Send Settings File* explained above.

Setup

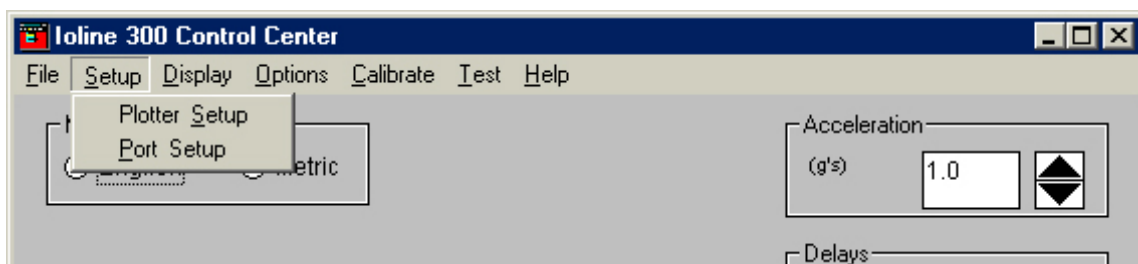


Figure 3-16 Setup Menu

Plotter Setup

Allows selection of the plotter model and COM port.

Com Port Setup

Provides a list of COM ports to select from.

Display

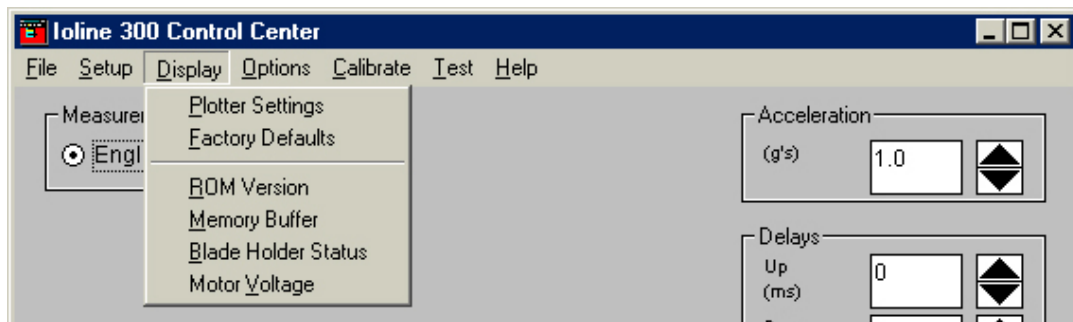


Figure 3-17 Display Menu.

Plotter Settings

Replaces all of the screen values with the current settings stored in the logic.

Factory Defaults

Replaces all of the screen values with the factory defaults. A dialog box will appear that allows these values to be sent to the plotter.

ROM Version

Displays the current ROM version installed in the plotter.

Memory Buffer

Displays the amount of buffer memory on the logic board. This value should be 12 K (kilobytes)

Blade Holder Status

Displays whether or not the blade holder is installed.

Motor Voltage

Displays the voltage of the motors that are installed in the 300 cutter. This option will only work with ROM version 106882 r0 and higher.

Options

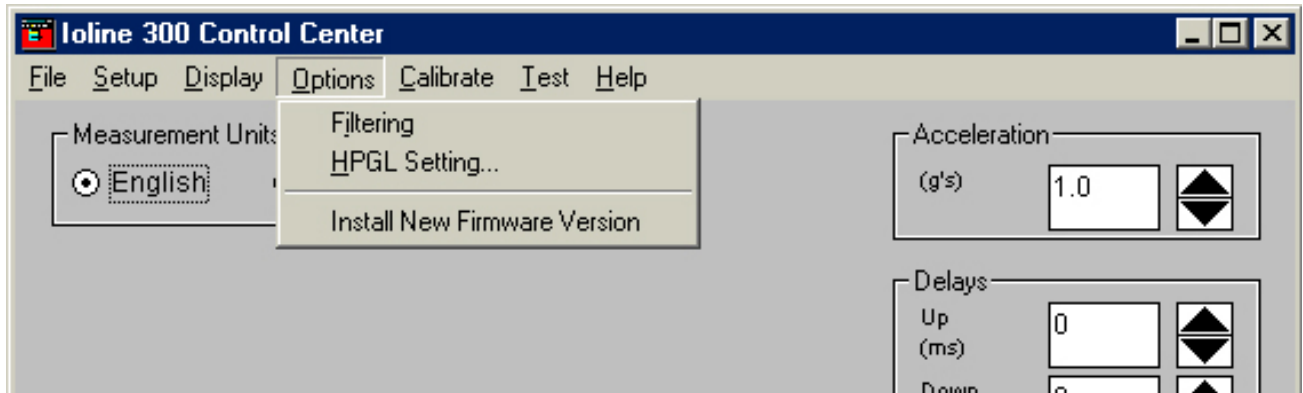


Figure 3-18 Options Menu

Filtering

Displays the filtering dialog window. Some files don't produce quality curves, and line structure, enabling the filtering option helps to smooth out some of these lines.

HPGL Setting...

Allows the 300 cutter to switch between HPGL/7475 (Corner origin), and HPGL/7596 (Center origin).

Install New Firmware version

- 1) Copy the file that was sent to you by Ioline Tech Support or downloaded off the Ioline web site to the hard drive of the computer that is connected to the 300 System Cutter.
- 2) Click on "Install New Firmware Version".
- 3) Click on "Begin Version Install".
- 4) The next window shows the file structure on your computer. Find the file that was sent to you (.BIN file). Click on the file, and click on "OK".
- 5) The plotter will make a beep sound, and the light will turn off. The new firmware will now start to load into the plotter. When it's done, close the Ioline Control Center, and turn the plotter off.
- 6) Reset the plotter by turning it back on while pressing and holding the "UP" arrow key on the keypad of the 300 System.

Calibration

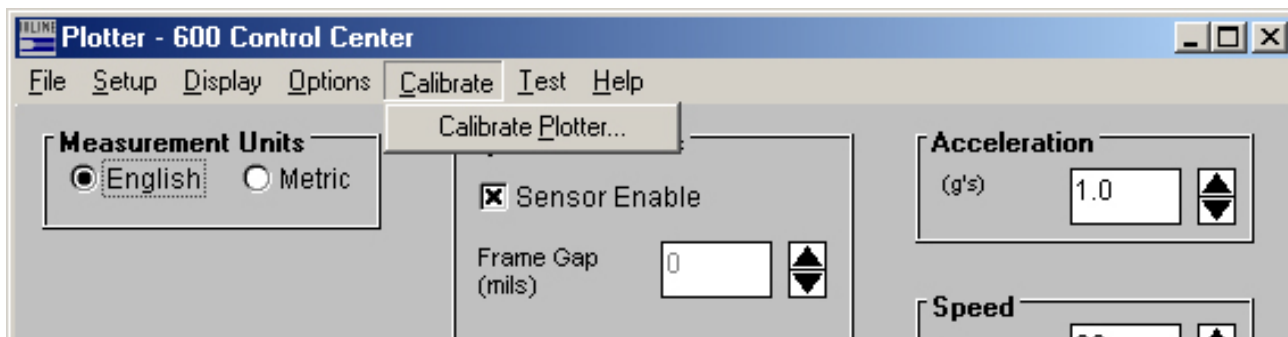


Figure 3-19 Options Menu

Calibrate Plotter

Provides methods to calibrate the cutter for maximum accuracy. The 300 System is calibrated at the factory, and does not need dimensional calibration. If you feel the cutter is not dimensionally accurate, contact Ioline Tech Support.

Test

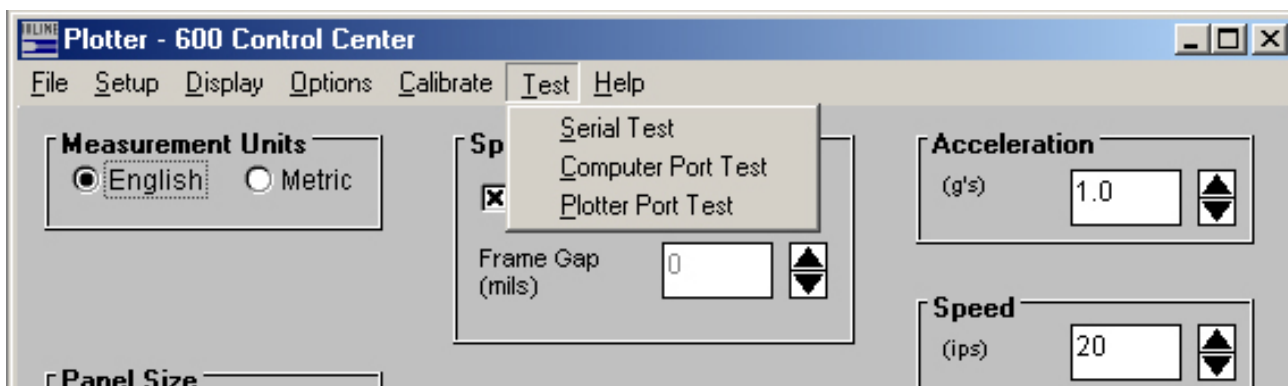


Figure 3-20 Options Menu

Serial Test

Tests the serial connection between the plotter and the computer. See *Chapter 4, Communications Problems* for further information.

Computer Port Test.

Tests the serial port on the computer with a special tool available from Ioline. See *Chapter 4, Communications Problems* for further information.

Plotter Port Test.

Tests the serial port on the plotter with a special tool available from Ioline. See *Chapter 4, Communications Problems* for further information.

Help

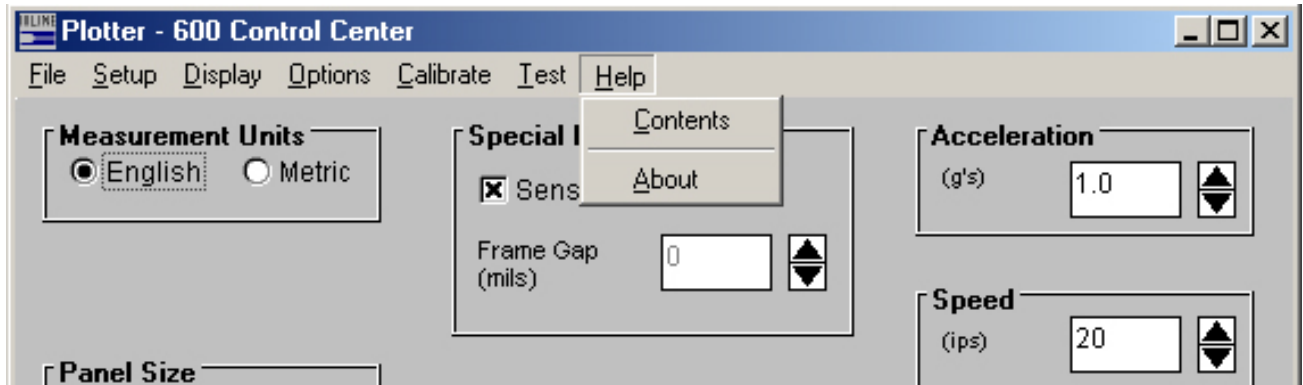


Figure 3-21 Help Menu

Contents

Lists the contents of the help screen.

About

Provides revision information about the Ioline Control Center software.



Chapter 4 Troubleshooting and Testing

This section contains guidelines and testing procedures for resolving most cutting difficulties. Some of this information coincides with repair procedures located in Chapter 5. The following primary topics are explained and illustrated:

- Basic Operational Difficulties
- Mechanical, Electrical, and Electronic Diagnostic Processes
- Contacting Ioline Customer Service

Basic Operational Difficulties

If the system isn't working correctly it is very important to determine which component is causing the problem. Likely difficulties may involve the computer, the power cord, parallel or serial cable, the design software, or the 300. If the problem appears to be with the computer or design software consult the appropriate documentation or an Ioline dealer first.

The information in the following sections has been organized to eliminate minor problems with easy solutions first. If these remedies do not fix the problem more complex and invasive resolutions are provided. If a solution cannot be found in this manual or by changing the software and computer setup, fill out the *Diagnostic Record* at the end of this chapter and contact Ioline customer service.

Common Problems

Problem	Cause	Solution
The cut file doesn't start in the correct place on the tray.	The "Origin" has not been set.	Press the "Set Origin" button on the keypad with the knife positioned where the cut file should start.
A file has been sent from the software, but the 300 won't cut.	A communication problem has occurred or the 300 is in "Stop" mode (Red LED).	Make sure the serial or parallel ports on the computer and the 300 are configured properly. Or press the "Start/Stop" button on the keypad to obtain a Green LED.

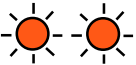
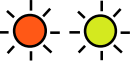
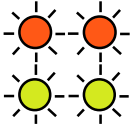
Error Messages

Error messages that are specific to the 300 are divided into two categories; software errors and LED codes. Software errors present themselves on the computer screen and usually indicate a communication problem. LED codes are visible below the keypad on the front panel of the 300 and can be green, red or a combination of both. The LED code table in this section is for finding the cause of obvious external or communication problems. Later in the chapter a more comprehensive LED index is available for complex mechanical and electronic difficulties. Other errors can occur with the operating system or the design software and should be resolved with the software vendor.

Software Errors:

Error Message	Problem	Solution
<i>Could not open COMx or LPTx</i>	The software could not locate the cutter on the specified COM or LPT port.	Verify the cutter is connected to that port, or check that the operating system recognizes the port.
<i>Green light not on or cutter not connected to COMx or LPTx</i>	The software opened the port but could not get a response from the cutter.	Be sure the cutter is connected to the selected port, that the cutters green LED is on, and that the cable connecting the computer to the cutter is functioning. Due to the nature of serial and parallel communication, it is possible to get this message if an attempt is made to interact with the cutter while it's cutting. If this is the case, wait for the 300 to finish cutting and send the file again.
<i>Setup COM port and check plotter present.</i>	The last operation requires that the plotter be connected to the port but the software could not find it.	Be sure the cutter is connected to the selected port, that the cutters green LED is on, and that the cable connecting the computer to the cutter is functioning.
<i>The plotter that you selected is not the same as the one connected to your computer.</i>	The Control Center cannot match the cutter that was chosen at the start up with the one found during initialization.	Select the correct plotter from the list.

L.E.D Codes

LED Sequence	Problem	Solution
 3+ Second pause then repeat	1. Buffer Overflow 2. Communication Problems 3. Defective RS-232 Chip.	1. Perform cutter reset.as outlined later in this chapter. 2. Perform communication test as outlined later in this chapter. 3. Replace the RS-232 chip.
 3+ Second pause then repeat	Outdated Firmware.	Check the Firmware version, install firmware if needed. Contact Ioline Tech Support
 Constantly Repeating	Plotter Language syntax error	The file being sent to the cutter is not of the same language that the cutter is looking for. Open the Ioline Control Center, and run a test file. If the error doesn't happen again, check the original file for problems.
 3+ Second pause then repeat	Carriage ("Y" axis) jam.	Check to make sure the carriage moves side to side freely, and remove all objects causing the jam to occur.
 3+ Second pause then repeat	Table ("X" Axis) jam	Chack to make sure the tray moves in and out freely, and remove any objects causing the jam to occur.
 2 Red Flash 2 Green Flash repeat	Logic Board Error	Call Customer Service

Legend	
	Solid GREEN Light Emitting Diode (LED)on the keypad
	Blinking GREEN Light Emitting Diode (LED) on the keypad
	Blinking RED Light Emitting Diode (LED) on the keypad

No Power When The 300 System is Turned On

If the 300 does not initialize or the fan does not spin when the power is turned on there are a few simple steps to follow to determine if a serious problem has occurred.

1. Check the power cord. Make sure that it is firmly plugged into the wall and into the back of the plotter.
2. Check the voltage at the wall outlet and verify that it is within the operating limits as specified in *Chapter 1, Specifications*.

If there are no problems with the power to the 300 System proceed to the *Mechanical, Electrical, and Electronic Diagnostic Process* later in this chapter.

The 300 Won't Respond to the Computer

If there is a problem getting the 300 to accept commands from the computer, perform these procedures:

- Verify that the communications cable is correctly connected to the plotter and to the proper communications port on the computer.
- Check to see that the computer LPT, or COM port that is being used is configured to match the 300's serial, or parallel port settings.
- Ξψχλε τηε ποωερ οφφ ανδ ον αγαιν το ρεσετ τηε χομμυνιχατιον πορτσ ον τηε 300 σψστεμ.
- Make certain that the file and the 300 are set to the same plotter language.
- If the connection is good and the port assignments appear to be correct, proceed to the next section.

Communication Problems

Many plotting problems can be resolved by testing and adjusting the communications between the plotter and the computer. There are three diagnostic tests that can be run from the 300 Control Center. These tests are designed to help determine if there are communications problems and isolate where the difficulty is occurring.

The last two tests require a diagnostic module (available from an Ioline dealer) connected to the serial port on the computer or the 300. If the following tests do not resolve the problem and the computer and software are working properly, proceed to the *Mechanical/ Electrical Diagnostic Process* later in this chapter.

Serial Communication Test:

Run this test from the 300 Control Center. The diagnostic module will NOT be needed to run this test.

1. Connect the serial ports on the 300 and the computer with a serial cable.
2. From the 300 Control Center screen, select **Test**.
3. Select **Serial Test**.
4. Turn on the 300 while holding down the **Test cut** key on the keypad until the 300 beeps and the LEDs flash three times.
5. Press the Start/Stop key on the keypad to verify that the handshake line (CTS), displayed on the computer, toggles ON and OFF. Leave the handshake lines ON. Press the **Repeat** key to switch the 300 into ECHO mode. The green LED will come on.
6. Press any key on the computer and verify that the character transmitted equals the character received. If the 300 and the computer pass all these tests there should not be any problems producing appliques from plot files.
7. Select **Exit** after completing the serial test.
8. Turn off the 300 at the end of the test. Normal communications will be restored when the power is turned back on.
9. If this test is successful the next two tests are not necessary.

Testing the 300 Plotter Port:

Run this test from the 300 Control Center. The diagnostic module WILL be needed to run this test.

1. Connect the diagnostic module directly to the 300 serial port.
2. Turn on the 300 while holding down the **Test Cut** key on the keypad. Hold down the Test Cut key until the 300 beeps and LEDs flash three times.
3. Press any arrow key to transmit and receive characters. Verify the 300 beeps and the green LED flashes.
4. Turn off the 300 at the end of the test. Normal communications will be restored when the power is turned back on.

Testing the Computer Port:

Run this test from the 300 Control Center. The diagnostic module WILL be needed to run this test.

1. Connect the diagnostic module directly to the serial port on the computer.
2. From the 300 Control Center, select **Test**.
3. Select **Computer Port Test**.
4. Verify that the COM port displayed is the correct one. If it is not, press the ESC key twice and select the correct COM port from the Setup, COM Port Setup menu. If any key other than ESC is pressed the computer serial test screen will be displayed.
5. Press any key on the computer keyboard and verify that the character transmitted is the same as the character received.

Cutting Quality Problems

Good cutting quality is dependent upon a number of different factors. The type of material, environmental conditions, and operator habits are only a few of the variables that can affect the quality of a cut. It is important that the 300 is loaded and maintained according to the guidelines in the *300 User's Guide* and in Chapters 2 and 5 of this manual. The table below is a summary of the most common difficulties:

Problem	Cause	Solution
<i>If a cut file has been sent, and the output is erratic.</i>	The file was sent with the wrong plotter language setting.	Make sure the file was created with the correct plotter language, or the cutter, and the Ioline Control Center are setup correctly.
<i>If the corners of lines on the completed applique are not completely meeting.</i>	1. Knife Offset is not set correctly 2. Knife overcut is set too low. 3. Loose set screw, or loose belt on the cutter.	1. Knife offset can be changed in the Ioline Control Center. <i>See Chapter 3 setup & operation of Ioline Control Center</i> 2. Overcut should be set to 20 for standard twill 3. See chapter 5 for procedures on how to fix a loose setscrew, or belt.
<i>If a cut file has been sent, and the output is VERY slow no matter how fast the speed is set.</i>	The cut file has too many "Nodes" in it.	If you are using Corel Trace to create applique files, the output will take a long time, and won't cut very nice. Instead, hand trace the file to reduce the amount of Nodes in the file.

Common Cut Quality Problems

Mechanical, and Electronic Diagnostic Process

The diagnostic processes that follow are detailed and invasive. Do not attempt to service the 300 until it has been determined that simpler solutions (see above) will not resolve the problem. It is recommended that the sequence represented in the following diagram be followed when troubleshooting the 300 System cutter. Make sure to record the results of any diagnostic examination on the *Diagnostic Record* at the end of the chapter.

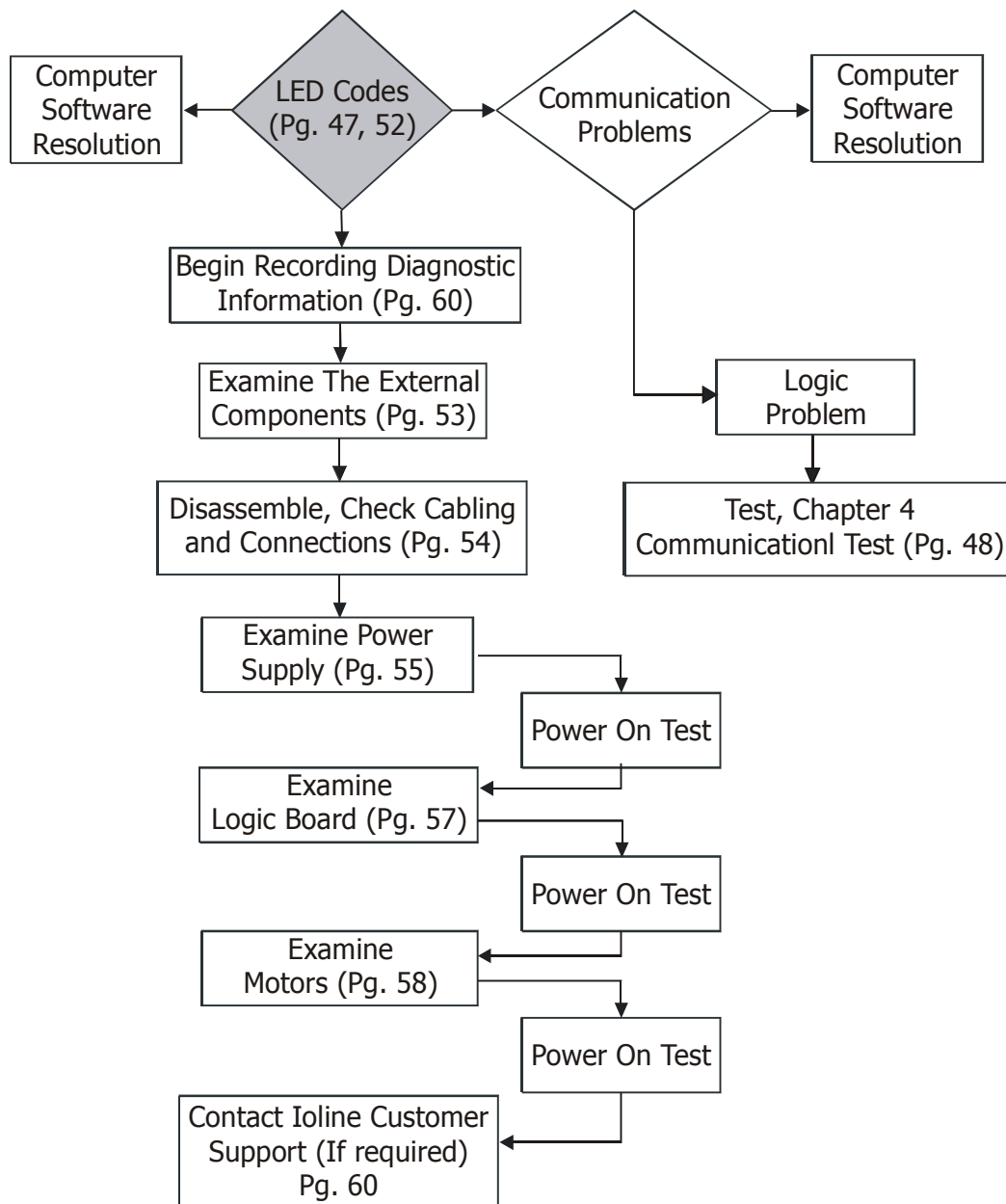
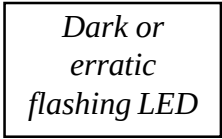
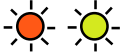


Figure 4-1. Mechanical, Electrical, and Electronic Diagnostic Flow Chart.

Expanded LED Codes

LED Sequence	Probable Cause	Solution
	• 300 System not plugged in • Cycling power supply due to: • Incorrect power supply or • defective power supply • Defective transistor(s) on the logic board • Short or other problem with motor • Defective power supply • Defective transistor(s) on the logic board • Defective keypad	• Plug unit into wall outlet • Check internally for damaged cabling and loose plugins • Replace defective transistor, or replace logic board. • Replace the defective motor • Replace defective transistor, or replace logic board. • Replace defective keypad
 3+ Second pause then repeat	• Carriage ("Y" Axis) jam due to: • Media or mechanical jam • Transmission failure • Defective power supply • Defective transistor(s) on the logic board • Defective motor encoder • Short or other problem with motor	• Clear any media causing the jam • Check internally for damaged cabling or loose wires • Replace power supply • Replace defective transistor or entire logic board • Replace defective motor
 3+ Second pause then repeat	• Tray ("X" Axis) jam due to: • Media or mechanical jam • Defective transistor(s) on the logic board • Defective power supply • Defective motor encoder • Short or other problem with motor	• Clear any media causing the jam • Check internally for damaged cabling or loose wires • Replace power supply • Replace defective transistor or entire logic board • Replace defective motor
 Less than 2 second pause then repeat	• Cycling power supply due to: • Incorrect power supply sequence or defective power supply • Defective transistor(s) on the logic board • Short or other problem with motor	• Clear any media causing the jam • Check internally for damaged cabling or loose wires • Replace power supply • Replace defective transistor or entire logic board • Replace defective motor
 Alternating Red & Green	• Syntax Error due to: • Defective power supply • Incompatible Syntax in plot file.	• Replace the defective power supply • Remake the plot file, or plot a file from the Ioline Control Center to verify the cutter is working properly.

External Inspection

Use these procedures if:

- The 300 did not initialize (dark LED, fan not running, carriage did not move or made small jerking movements at power on) after it was unpacked from the box and setup following the procedure outlined in the *300 User's Guide*.
- The 300 has been working but did not initialize after being reset by turning the power off then on.
- Jam messages occur without media or other objects obstructing normal operation.
- The carriage is making loud or unusual sounds.

Required Tools:

- Multimeter capable of reading AC voltage.
- Phillips head screw driver.
- Allen wrenches: 1/16" and 5/64".
- Nut driver or socket wrench with extension: 11/32".

Inspecting the Outside of the Unit:

1. Turn the plotter off.
2. Inspect the unit for damage or obvious signs of mechanical malfunction.
3. Measure the voltage at the wall outlet to verify that it is between 100 and 250 VAC.
4. Clear all media paths and ensure that nothing is obstructing the movement of the tray.
5. Move the carriage from side to side by hand. If the carriage resists easy movement then a short is probably present on the logic board or in the motor. Follow the disassembly procedures in *Chapter 5, General Disassembly Procedures* then consult *Testing the Logic Board* and *Testing the Motors* later in this chapter.

Perform the following disassembly:

1. Unplug the power cord from the wall outlet and the data cable from the computer.
2. Remove the plastic end covers from the end plates following the procedures outlined in *Chapter 5*.

Internal Cabling and Connection Inspection

WARNING

- *The 300 cutter is very heavy and could cause an injury if it falls. Make sure that another person assists with moving the cutter .*
- *When the bottom cover of the 300 is removed and the power is on there is an electric shock hazard. These diagnostic procedures should only be performed by qualified technical personnel or individuals that are aware of safe practices with 110 VAC and 220 VAC devices.*

Use this procedure if:

- The procedures in *External Inspection* did not resolve the difficulty.

Tools Required:

- Phillips head screw driver.
- 5/32" allen wrench (supplied).
- Two people capable of lifting 50 pounds each.
- Grounding strap (optional).

Initial Internal Inspection:

1. Fully disassemble the 300 as described in *Chapter 5, General Disassembly Procedures*.
2. Many components in the 300 are sensitive to static discharge. Make sure that any static electricity is discharged before attempting any service procedures. A grounding wrist strap works the best and can be provided by Ioline on request.
3. Inspect all of the connectors on the power supply, logic board and at the motors to determine if anything came loose during shipping or from rough handling. Gently push on all plugs and socketed logic chips to ensure that they are properly seated.

WARNING

When the plotter is connected to a wall outlet there are high voltages on the power supplies that could cause an injury. Be extremely careful!

4. Plug the cutter back into the wall and turn it on. Check to see if the plotter resets.

If these procedures are not effective in solving the problem continue to *Testing the Power Supplies* for the next step in the diagnostic process.

Testing the Power Supply

Tools Required:

- Multimeter capable of reading DC voltage.
- Ioline power supply test fixture..
- Soldering apparatus (optional).
- Insulating material (electrical tape, mylar strips, etc.)

Inspecting the Fuse and Output Terminals:

1. Turn the power off.
2. Inspect the onboard power supply fuse. If it is defective it can be replaced with a 3/4" x 3/16", 3 AMP, GFE, fast blow fuse or equivalent.
3. Examine the metal terminals at the +24 V, +5 V and ground output wires. The insulation for these wires is colored red for +5 V, yellow for +24 V, and black or brown for ground. They should be flush against the board and unable to touch each other.
4. If it looks like they could short or if arcing has occurred, re-solder as necessary and/or insulate the wires so that they can no longer contact each other.
5. The power supply may also be returned to Ioline for a replacement.
If this does not isolate a power supply problem continue to the next step.

Testing the Power Supply Output Voltage:

1. Turn the power off.
2. Mark the power supply connectors with their associated socket number (J3 or J7).
3. Unplug both power supplies from the logic board. It is very important that they be disconnected from the logic board for correct voltage readings.
4. Connect one of the power supplies to the Ioline Power Supply Test Fixture *. The plug will only fit on one way.

* If the Ioline test fixture is not available insert a 20 Ω , 5W resistor into the plug between one of the red (+5V) wires and one of the black or brown ground wires. The voltages are labeled on the logic board at the J3 and J7 connectors.

5. The fixture provides labeled test points for all output voltages. Turn the power on and measure the voltages. All of them should be tested relative to the associated ground pin (the +5 V shares a common ground) and should read as labeled ($\pm 10\%$). Repeat this procedure for the other power supply.
6. If any voltage fluctuates wildly or is not within 10% of the specified value then replace the power supply. If the voltages are within the tolerances continue to the next step.

If these procedures are not effective in solving the problem read *Testing the Logic Board* for the next step in the diagnostic process.

Reference Information for the Power Supply Test Fixture:

The information below describes the resistive loads imposed on the power supply when the Ioline Power Supply Test Fixture is used. While not as effective, a 20 Ω , 5W resistor between +5V (red) and ground (black or brown) will also work for testing.

- $R_{5vload} = 20 \Omega$, 3 watt ($I_{5vload} \cong 250 \text{ ma}$)
- $R_{12vload} = 500 \Omega$, 1/2 watt (use 2 X 1K Ω res. for $I_{+12vload} \cong 24 \text{ ma}$)
- $R_{-12vload} = 500 \Omega$, 1/2 watt (use 2 X 1K Ω for $I_{-12vload} \cong 24 \text{ ma}$)
- $R_{24vload} = 1 \text{ K } \Omega$, 1/2 watt (use 2 X 2K Ω 1/4 watt resistor for $I_{24vload} \cong 24 \text{ ma}$)
- All load resistors should be within a $\pm 20\%$ tolerance

Testing the Logic Board

Use this procedure if:

- The procedures in *Testing the Power Supplies* did not resolve the difficulty.
- The carriage was difficult to move during external inspection.

Tools Required:

- Phillips head screw driver.
- Multimeter capable of reading resistance in Ohms (Ω).
- Soldering apparatus and grounding strap (both optional).

Testing the FETs (Transistors):

1. Turn the power off. Discharge any static electricity as described above.
2. Find the motor power transistors (FETs) on the logic board. They are located near the power input plugs J3 and J7 and are labeled Q1-Q8 and Q10-Q11.
3. If any of FETs have melted, smell acrid or burnt, or have discolored the logic board they should be replaced.
4. Using a multimeter test the resistance between the source (S) and drain (D) leads and between the gate (G) and drain (D) leads on each of the transistors.
5. If any of the resistance measurements are less than 500 k Ω the part is suspect. If any readings are below 1 Ω there is an internal short and a definite FET failure.
6. If the FETs are defective and the logic board is revision 0 the entire board should be replaced with the newest version. If the logic board is revision 1 the defective FETs can be replaced with exact duplicates. The transistors at locations Q1, Q3, Q5, Q7, and Q10 are p-channel FETs and can be replaced with Ioline part number 105858. The transistors Q2, Q4, Q6, Q8, and Q11 are n-channel FETs and require Ioline part number 102807 for replacement.
7. If replacing a FET is not possible remove and replace the entire logic board.
8. Before the plotter is re-tested with a new logic board and/or new transistors make sure that any media or mechanical jams have been cleared so that the FETs are not damaged in the same manner that might have caused their original failure.

Testing and Replacing the Other Logic Components

1. If all of the other diagnostic procedures have been exhausted and the FETs are testing good, change the logic board. Communications problems may indicate that the RS-232 chip may need to be replaced. This socketed component is located at U25. No other logic board components can be field tested.

If these procedures are not effective in solving the problem read *Testing the Motors* for the next step in the diagnostic process.

Testing the Motors

Use this procedure if:

- The procedures in *Testing the Logic Board* did not resolve the difficulty.

Tools Required:

- Phillips head screw driver.
- Allen wrenches: 1/16", 5/64".

Initial Motor Inspection:

1. Move the tray in and out, and move the carriage side to side while listening to the associated motor.
2. If there is any grinding, squeaking, or clicking from within the motor it is probably defective. Return the motor to Ioline for a replacement.

Likely Modes of Motor Failure:

1. *An internal short has occurred.* This malfunction exhibits itself as a jam and causes the motor to be more difficult to turn by hand. To determine if a carriage motor has shorted, unplug the input power leads and move the carriage by hand. If the motion has a high resistance the motor is probably shorted.
2. *The motor encoder has failed.* The encoder allows the plotter logic to keep track of axis positions and speeds. When an encoder fails the motor may work at low speeds but during acceleration it speeds up abnormally then jams.

Tray (X Axis) Motor Replacement:

If the tray quickly accelerates and jams and the FETs are not defective, or if unexplainable X axis jams occur the motor may be defective. See *Chapter 5, X-Axis Motor Replacement* section for the replacement procedure.

Carriage (Y Axis) Transmission

1. Turn the power off.
2. Make sure that the carriage (Y axis) transmission belts are not damaged, mistracking or loose. Closely check the belt teeth for excessive wear.
3. Loosen the transmission retaining nuts (there are four) with the 11/32" nut driver and retighten them.
4. Tighten the allen set screws on the pulleys with the 1/16" and 5/64" allen wrenches.
5. Ensure that the three allen screws (5/64" allen wrench) holding the motor to the transmission bracket are not loose.
6. Actuate the transmission by depressing the left and right keypad arrows with the power on. Test both directions for at least 5 seconds.
7. If unusual noises or mechanical malfunctions are present remove the transmission and return it to Ioline for a replacement.

If these procedures are not effective read *Internal Cabling and Connection Inspection* for the next step in the diagnostic process.

Carriage (Y Axis) Motor Replacement:

If the carriage quickly accelerates and jams and the FETs are not defective or if unexplainable jams occur the motor may be defective. See *Chapter 5, Y-Axis Motor Replacement* section for the replacement procedure.

Testing the New Motor:

1. After installation, test the new motor(s) with the keypad arrow keys for five to ten seconds.
2. It is important that care be taken when changing the motor and that proper belt tensions and alignment be attained after the new unit is installed. Never separate the motor and encoder assembly.
3. If replacing and adjusting the motor cannot be accurately accomplished contact a qualified service dealer or Ioline customer service for assistance.

If the difficulty persists and the *Diagnostic Record* (see next page) is completed, contact an Ioline dealer Ioline Customer Service for further help.

Contacting Ioline Customer Service

If the suggestions and guidelines in this manual cannot help resolve the difficulty contact Ioline Customer Service. When speaking with a customer service representative they will ask a number of questions regarding the results of the diagnostic investigation. Use the following form to record the observations so Ioline can expedite solving the difficulties.

Diagnostic Record

- What is the serial number for this unit? _____ Logic board revision # ? _____
- Who was the dealer that sold it to you? _____
- Has the unit been working properly up to the point of the recent failure?
YES _____ NO _____
- Are there any blinking LEDs or beeping sounds associated with this problem?
YES _____ NO _____
If yes, please describe them. _____
- Were there communication or computer software problems?
If yes, please describe them. _____
- When the plotter is first turned on, does the pen carriage move fully to the right?
YES _____ NO _____
- Does the fan come on? YES _____ NO _____
- With the power off, slide the carriage from side-to-side.
 - Does the carriage slide easily to each side? YES _____ NO _____
 - Is there more resistance to move the carriage to the left _____, the right _____, or is it equal? _____
- Were all of the cable connections securely fastened to the logic board.
YES _____ NO _____
- Were all logic components seated in the logic board. YES _____ NO _____
- Was the power supply shorting at the terminals? YES _____ NO _____
- Was the power supply voltages within the tolerances? YES _____ NO _____
- Record the power supply voltage readings here:

J3, VMOT(+24V)_____	J7, VMOT(+24V)_____
J3, +12V_____	J7, +12V_____
J3, -12V_____	J7, -12V_____
J3, +5 (1)_____	J7, +5 (1)_____
J3, +5 (2)_____	J7, +5 (2)_____
- Were any of the transistors on the logic board defective? YES _____ NO _____
If yes, which ones?
Q1____ Q2____ Q3____ Q4____ Q5____ Q6____ Q7____ Q8____
- Were any of the motors or encoders bad?
If yes, which ones? X motor/encoder__ Y motor/encoder__
- Please list any other difficulties. Be very specific about the nature of the problem and any symptoms associated with it.

Re-Packing the 300

If the 300 must be returned to Ioline for repair it must be shipped in the original packaging supplied with the plotter. To repackage the 300 use the plotter Boxing Procedure Diagram in Chapter 6. Contact Ioline Customer Service for shipping instructions.



Chapter 5 Repair and Maintenance

Repair and Maintenance

This section contains instructions for replacing failed assemblies and maintaining the 300 system cutter. The testing procedures for determining if an assembly is causing difficulties are located in Chapter 4. The following subsystems and procedures are explained and illustrated:

- Cleaning and Regular Maintenance
- General Disassembly Procedures
- Y-Axis Subsystem
- X-Axis Subsystem
- Electrical Subsystem
- Electronic Subsystem

List Of Recommended Tools And Equipment

All of the tools and equipment that are needed to perform the repair and adjustment procedures are listed below:

1. Number 2 Phillips magnetic head screwdriver
2. Precision Pull Scale 1 kg x 20 g (36 oz x 1/2 oz)
3. 9/64", 5/64", 5/32" (supplied), 1/16", and 1/8" Hex Wrenches
4. Socket Wrench Driver
5. 9" Socket Wrench Extension
6. 3/8" Socket or Nut Driver
7. 11/32" Socket
8. 11/32", 1/2", and 9/16" Open End Wrenches
9. Exacto Blade
10. Double back tape
11. Needle nose pliers
12. Volt/Ohm Meter
13. Static Grounding Strap (supplied on request)
14. Ioline Power Supply Test Fixture (available from Ioline)
15. Ioline Serial Port Test Fixture (available from Ioline)
16. Plastic Cable Ties

Cleaning And Regular Maintenance

Cleaning the Traverse Extrusion and Carriage Wheels

As dust and debris accumulate on the traverse extrusion it will have to be wiped off with an isopropyl (pharmacy) alcohol dampened, lint-free cloth.

1. With a clean cloth dampened with Isopropyl alcohol wipe the traverse extrusion where the carriage wheels ride on the rail. Move the carriage side to side while wiping the traverse so as to clean the entire surface. See chapter 2 Nomenclature for the location of the traverse.

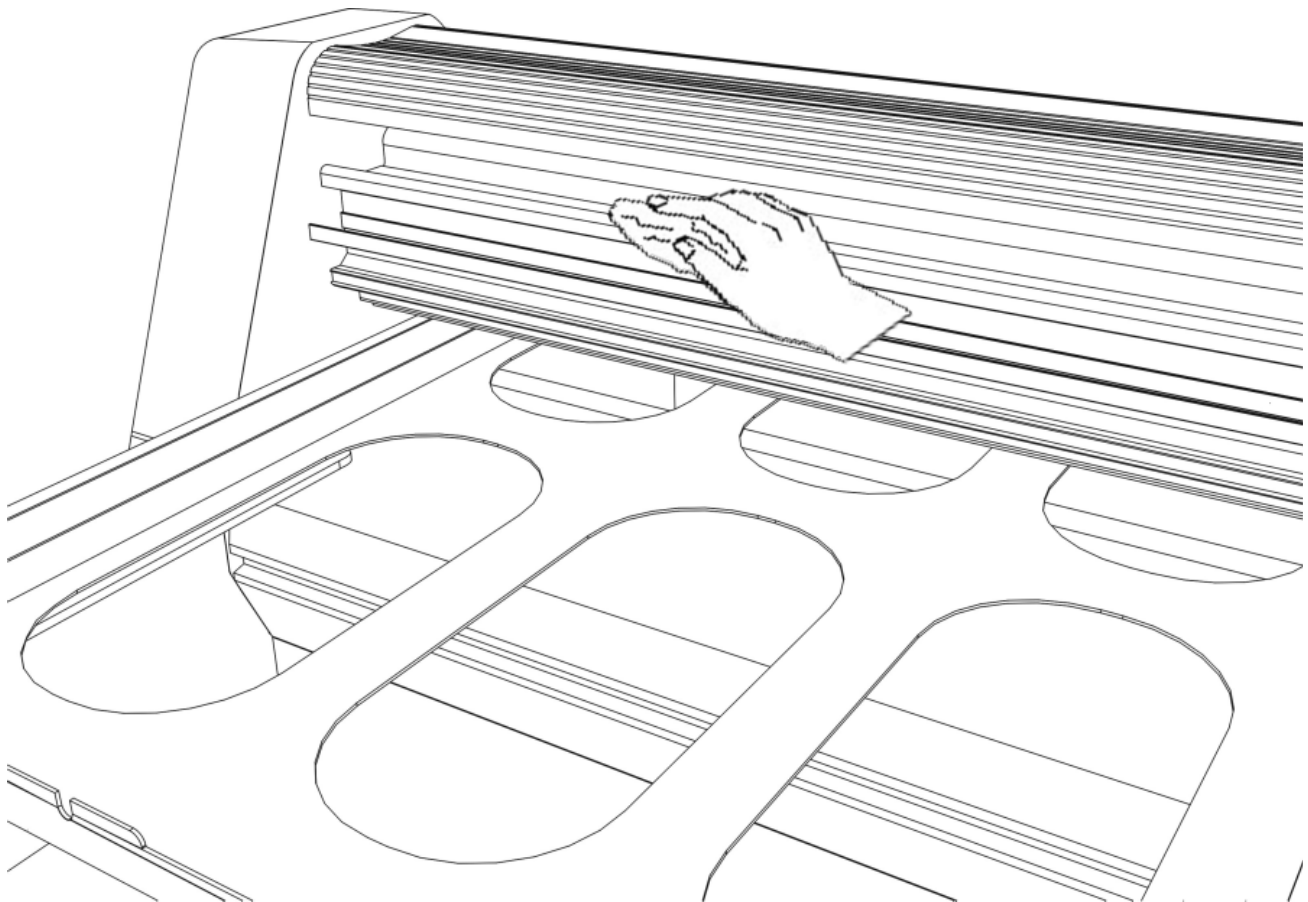


Figure 5-1. Cleaning the Traverse Extrusion

General Disassembly Procedures

The following procedures describe the basic disassembly of the 300 system cutter to gain access to the keypad, power, and drive components. Please pay close attention to the **Warning** and **Caution** notes.

Removing the End Covers

1. Turn off the 300 and unplug the computer data, and power cables.
2. Remove the two black phillips head screws, and the single silver phillips head screw on the bottom of the cover, then remove the right cover. To access the rear black screw, you may have to move the tray forward. *See figure 5-2 below.*
3. Remove the two black phillips head screws, and remove the left cover. *See figure 5-3 on the next page.*

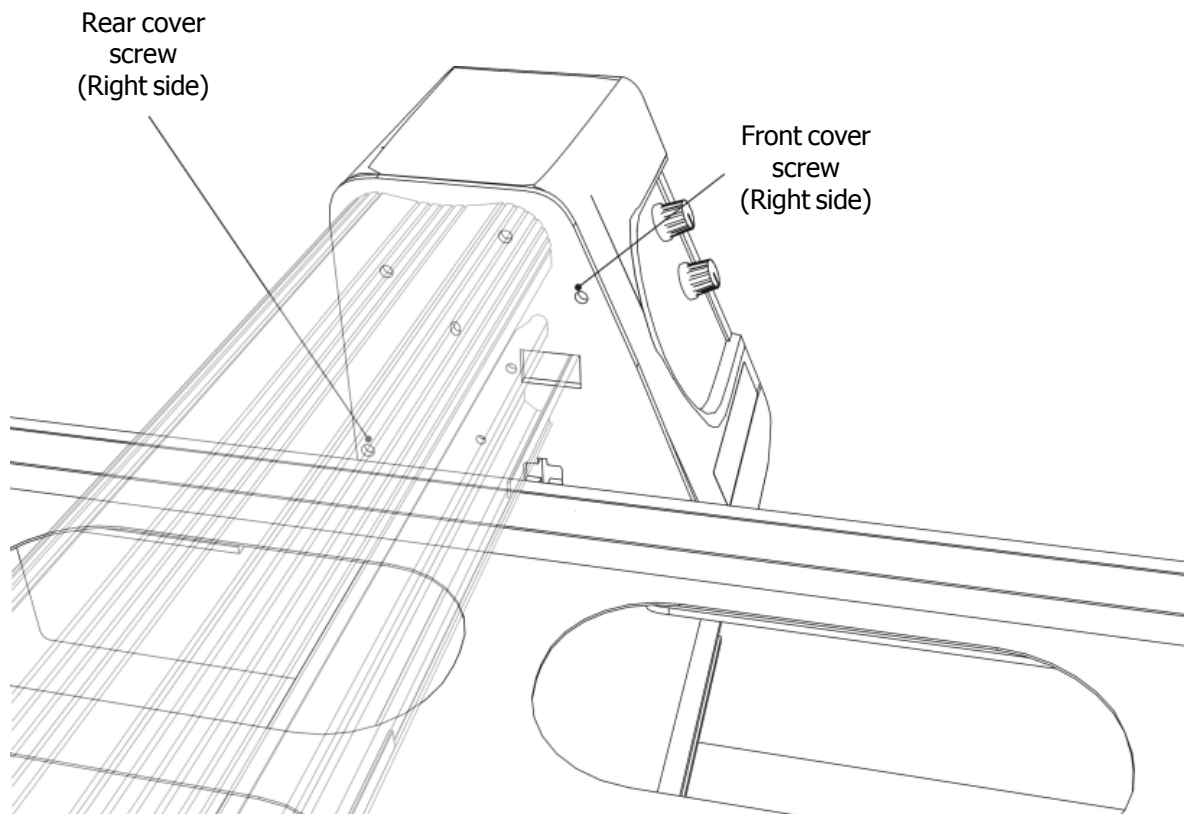


Fig. 5-2 Right side cover screws (Black Phillips head)

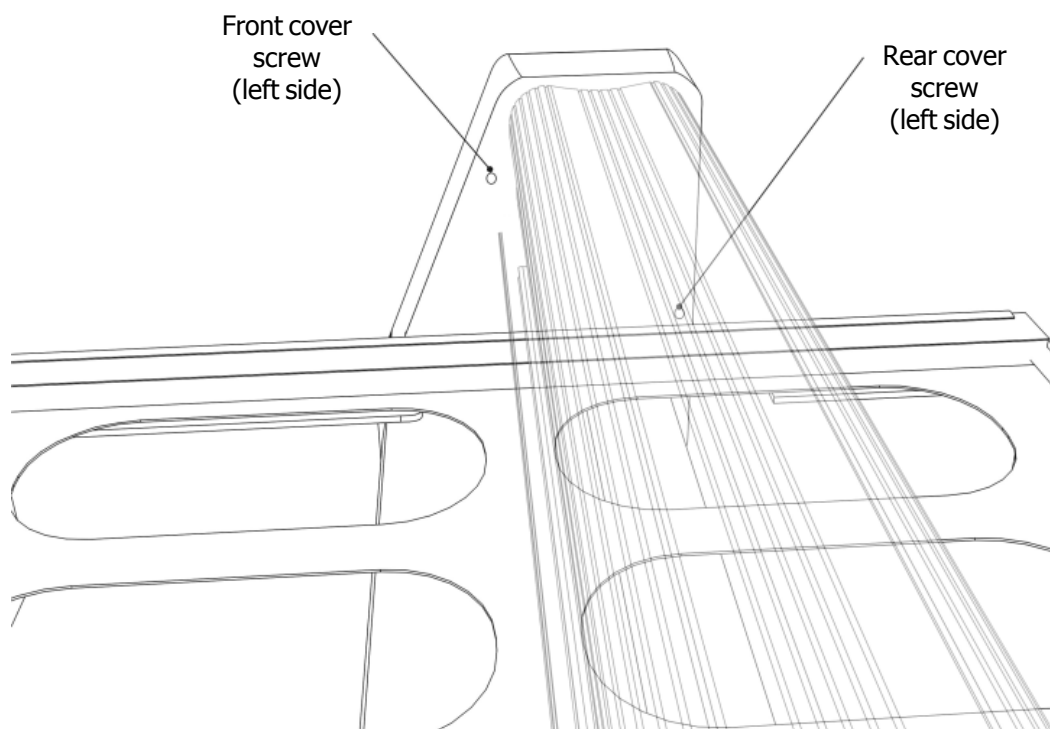


Fig. 5-3 Left side cover screws (Black Phillips head)

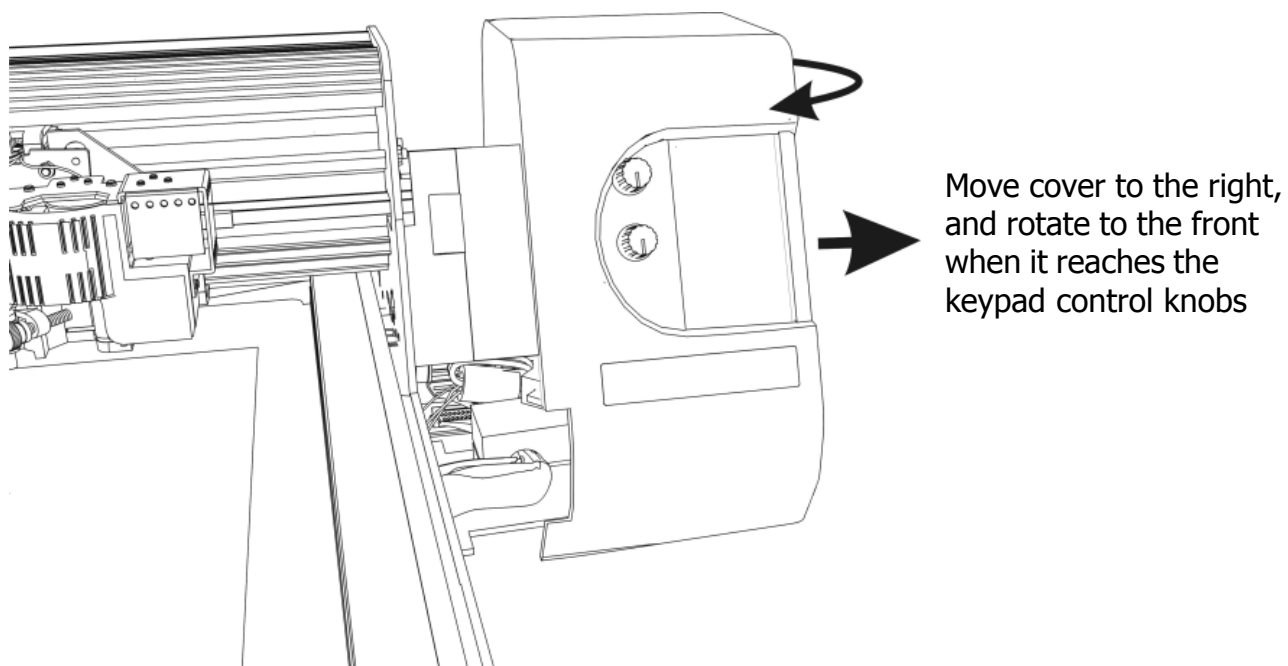


Fig. 5-4 Removing the right side cover

Removing the Bottom Cover for Internal Access

WARNING

- *The 300 system cutter is very heavy and could cause an injury if it falls. Make sure that another person assists with moving the cutter.*
- *When the bottom cover of the 300 is removed and the power is on there is an electric shock hazard. These diagnostic procedures should only be performed by qualified technical personnel or individuals that are aware of safe practices with 110 VAC and 220 VAC devices.*



Do not lift the 300 by its top dust cover, or the tray assembly. Use the bottom surfaces of the end plates for lifting and moving the plotter.

Tools Required:

- Phillips head screw driver.
- Two people capable of lifting 50 pounds each.
- Grounding strap (optional).

Perform the Following Disassembly:

1. Turn the power off, and disconnect the computer data, and power cables.
2. Move the carriage assembly to the right side of the cutter.
3. Remove the right side cover. *See Removing the covers earlier in this chapter.*
4. Use your assistant to help you flip the 300 cutter over onto its top dust cover. Use the right side cover to place under the tray so it doesn't fall over while it's on its top. See figure 5-5
5. Remove the phillips screws along the bottom cover's edge. See figure 5-6
6. While removing the bottom cover, take care in unplugging the fan wire from the logic board

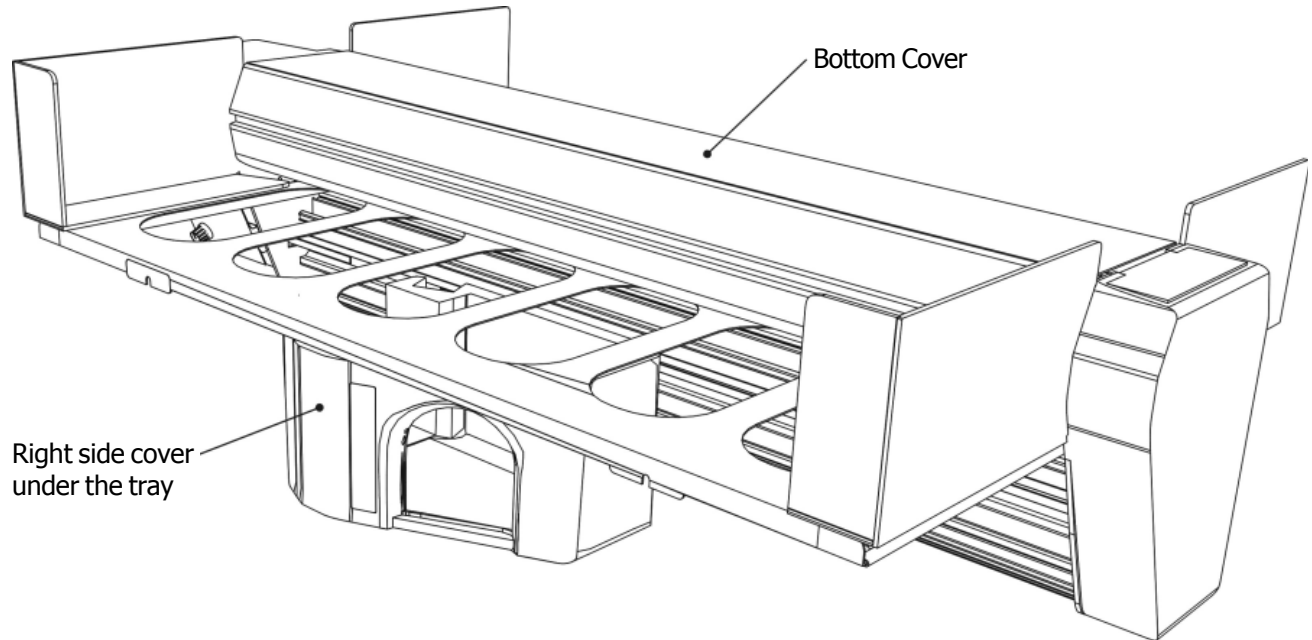


Fig. 5-5 Turn 300 over, and place right side cover under tray

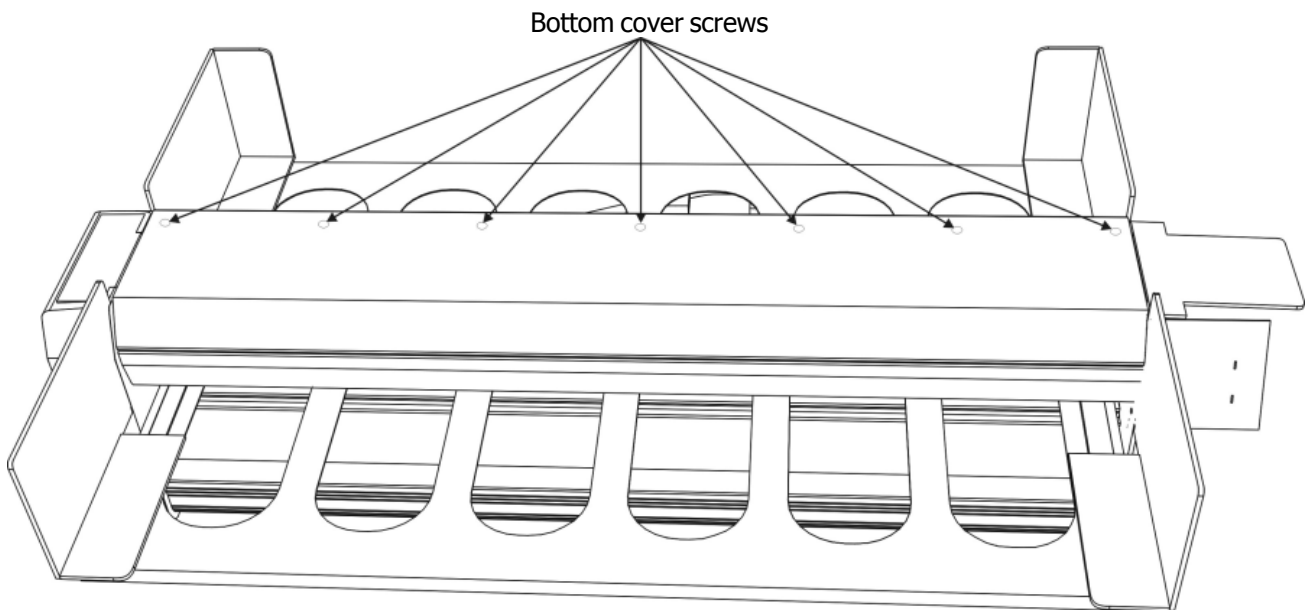
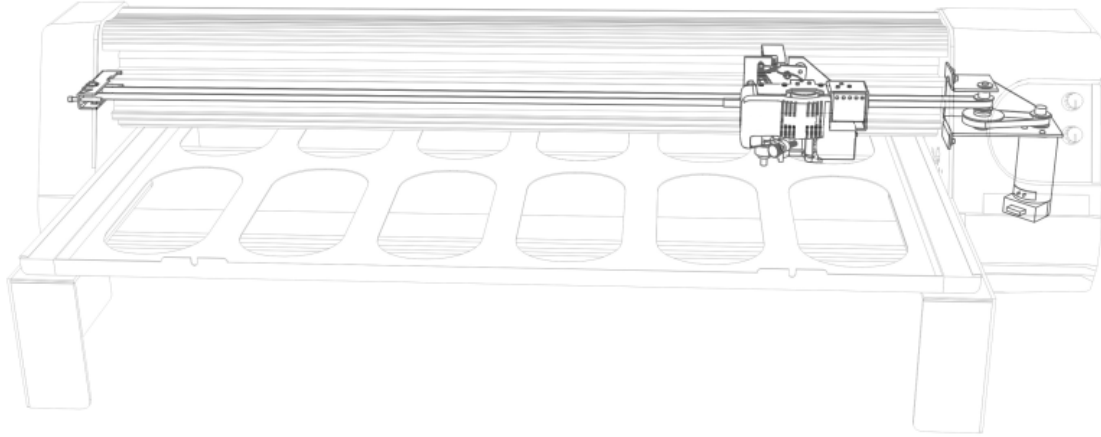


Fig. 5-6 Bottom cover screws

Y Axis Subsystem



CARRIAGE

Carriage Replacement:

1. Shut off the cutter and remove the power and computer data cables.
2. Remove the right (3 screws) and left (2 screws) end covers. See *Removing the End Covers* earlier in this chapter.
3. Loosen the allen screw on the belt tensioner (left side of the machine) until the bracket is flat against the end plate. Do not remove the screw.
4. Grasp one of the metal “T”-connectors on the end of the Y Axis belt and pull it out and toward the center of the carriage until it pops free. Make sure that the tensioner assembly is not tangled in the belt. Remove the other end of the belt.
5. Remove the carriage from the machine by pushing down on the belt attachment brackets, and pulling out on the bottom wheels.
6. Mount the new carriage on the traverse extrusion by aligning the upper wheel with the upper rail, push down on the belt attachment brackets, then slip the lower wheels onto the bottom rail and let the carriage rest.
7. Insert one of the metal “T”-connectors into the grooves on the front of the carriage body.
8. Align the tensioner assembly with the indentations on the end plate and apply light tension to the belt by tightening the allen screw.
9. Move the carriage to the far right closest to the keypad.
10. Adjust the belt tension by tightening the belt tensioner until the spring scale measurement at the center with the belt pulled 1” out from the normal position is 320 +/-20 grams. See “Y” axis belt replacement on Pg. 74.

11. Plug the power cord into the 300 and into a wall outlet. Move the carriage back and forth across the traverse extrusion with the keypad keys while watching the Y Axis belt. If there is excessive noise or if the belt is badly misaligned the 11/32" nuts can be loosened and the transmission can be adjusted slightly to achieve proper alignment.
12. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures earlier in this chapter*.
13. If problems arise contact Ioline customer service.

Replacing the Carriage Ribbon Cable:

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) and left (2 screws) end covers. See *Removing the End Covers and Dust Cover earlier in this chapter*.
3. Perform the procedures in *Removing the Bottom Cover for Internal Access earlier in this chapter*.
4. Perform the procedures in *Replacing and removing the carriage earlier in this chapter*.
5. Disconnect the ribbon cable from the carriage by sliding the rectangular locking collar away from the socket. The collar is fragile so be very careful when loosening it.
6. Gently pull the ribbon cable out of the channel. A piece of two sided foam tape holds the cable on the channel bottom so do not pull hard. Feed the cable through the top slot in the end plate. Another piece of foam tape holds the ribbon cable to the end plate so take care in removing the ribbon cable from the slot.
7. Discharge any static electricity that has accumulated and remove all of the plugs and connections on the power supplies. Use the *Interconnect Diagram* in the *Appendix* section as a location guide.
8. Remove the power supply (2 screws in the removable metal pan) by loosening the phillips head screws and pulling the unit out of the track in the platen.
9. Disconnect the ribbon cable from the logic board by sliding the rectangular locking collar away from the socket. The collar is fragile so be very careful when loosening it.

Ribbon cable replacement cont...

10. Feed the ribbon cable out of the plastic retainers on the underside of the platen and through bottom slot in the end plate.
11. Feed the new ribbon cable through bottom slot in the end plate and into the plastic retainers on the underside of the platen. Make sure that the exposed metal leads face up (toward the bottom of the platen).
12. Connect the ribbon cable to the logic board by inserting the cable into the rectangular connector until it stops (the locking collar must be pulled out). Make sure that the exposed metal leads face up (toward the bottom of the platen). Slide the locking collar toward the socket until it snaps shut. The collar is fragile so be very careful when closing it.
13. Replace the power supply plug using the chassis assembly diagrams in the *Appendix* as a guide. Connect all of the plugs using the *Interconnect Diagram* in the *Appendix* section.
14. Rotate the 300 back so that it is in normal operating position. Feed the ribbon cable through the top slot in the end plate. The exposed metal leads should face up toward the top of the plotter. Make sure that the cable is stuck to the foam tape on the end plate.
15. Gently pull the ribbon cable taut and press it onto the two sided foam tape on the channel bottom.
16. Connect the ribbon cable to the carriage by inserting the cable into the rectangular connector until it stops (the locking collar must be pulled out). Make sure that the exposed metal leads face down (toward the bottom of the channel). Slide the locking collar toward the socket until it snaps shut. The collar is fragile so be very careful when closing it.
17. Remount the carriage to the traverse following the carriage removal instructions in reverse.
18. Plug the power cord into the 300 and into a wall outlet. Move the carriage back and forth with the keypad keys while watching the ribbon cable in the track. If the cable snags in the channel check for proper alignment where the cable is stuck to the foam tape.
18. Reconnect the computer data cable and perform test plots. If the carriage does not function check that the cable is oriented correctly in the rectangular connectors. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
19. If problems arise contact Ioline customer service.

Y Axis Transmission**Y-Axis Transmission Replacement:**

Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cables.
2. Remove the Right & left end covers. See *Removing the End Covers*.
3. Loosen the allen screw on the belt tensioner until the screw is not exposed. Do not remove the screw.
4. Grasp one of the metal “T”-connectors on the end of the Y-Axis belt and pull it out and toward the center of the carriage until it pops free. Make sure that the tensioner assembly is not tangled in the belt. Remove the other end of the belt from the carriage.
5. Pull the Y Axis belt through the holes in the right end plate. The belt may have to be threaded through the pulleys in the Y Axis transmission.
6. Disconnect the motor power cables (Red and black), and the encoder plug-in (Black connector at the bottom of the motor) from the base of the motor. See *Fig. 5-7*.
7. Loosen and remove the four 11/32” nuts that hold the Y Axis transmission onto the end plate.
8. Install the new transmission on the end plate with the motor body pointing down.

- Secure the assembly with the 11/32” nuts from the previous step.
9. Reconnect the power cables with the red wire attached at 1 and the black wire attached at 2, and the encoder plug-in at the base of the motor.
 10. Thread the Y Axis belt through the access slots in the end plate and around the empty pulley in the transmission. It is very important to make sure that there are no twists in the belt and that the belt teeth properly engage the pulley.
 11. Insert one of the metal “T”-connectors into the grooves on the back of the carriage body.
 12. Align the tensioner assembly with the indentations on the end plate and apply light tension to the belt by tightening the allen screw.
 13. Move the carriage to the far right.
 14. Adjust the belt tension by tightening the belt tensioner until the spring scale measurement at the center with the belt pulled 1” out from the normal position is 320 +/-20 grams.
 15. Plug the power cord into the 300 and into a wall outlet. Move the carriage back and forth across the traverse extrusion with the keypad keys while watching the Y Axis belt. If there is excessive noise or if the belt is badly misaligned the 11/32” nuts can be loosened and the transmission can be adjusted slightly to achieve proper alignment.
 16. Cable tie the wire bundles together to ensure that they do not interfere with moving parts and end cover replacement.
 17. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
 18. If problems arise contact Ioline customer service.

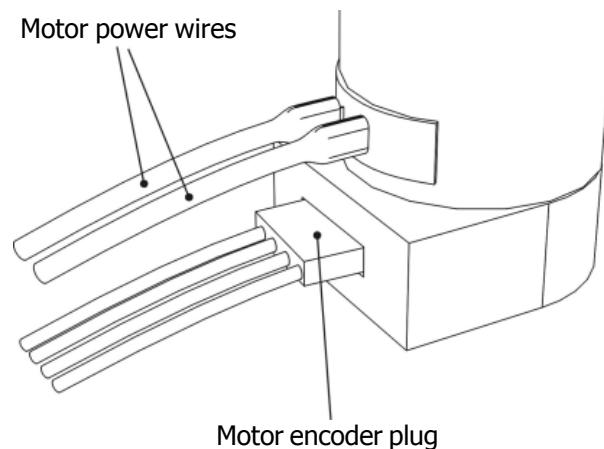


Fig. 5-7 Motor wires (*Power & Encoder*)

Y Axis Motor Replacement:

Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover. See *Removing the End Covers* above.
3. Disconnect the motor power, and motor encoder wires from the base of the motor. See *Fig. 5-5*
4. With a 9/64" HEX wrench, loosen the two HEX setscrews on the motor gear pulley. See *fig. 5-6*
5. With a 1/8" HEX wrench, remove the three black HEX screws at the base of the gear pulley. See *fig. 5-6*
6. Carefully slide the gear pulley off the motor shaft, and remove the motor from the transmission housing. Sometimes the pulley can be hard to remove, you may need to pry the pulley off the motor shaft.
7. Follow the procedures in reverse order to remount the new motor, then adjust the belt tension. See *Fig. 5-9 & 5-10 on Pg. 76*
8. If problems arise contact Ioline customer service.

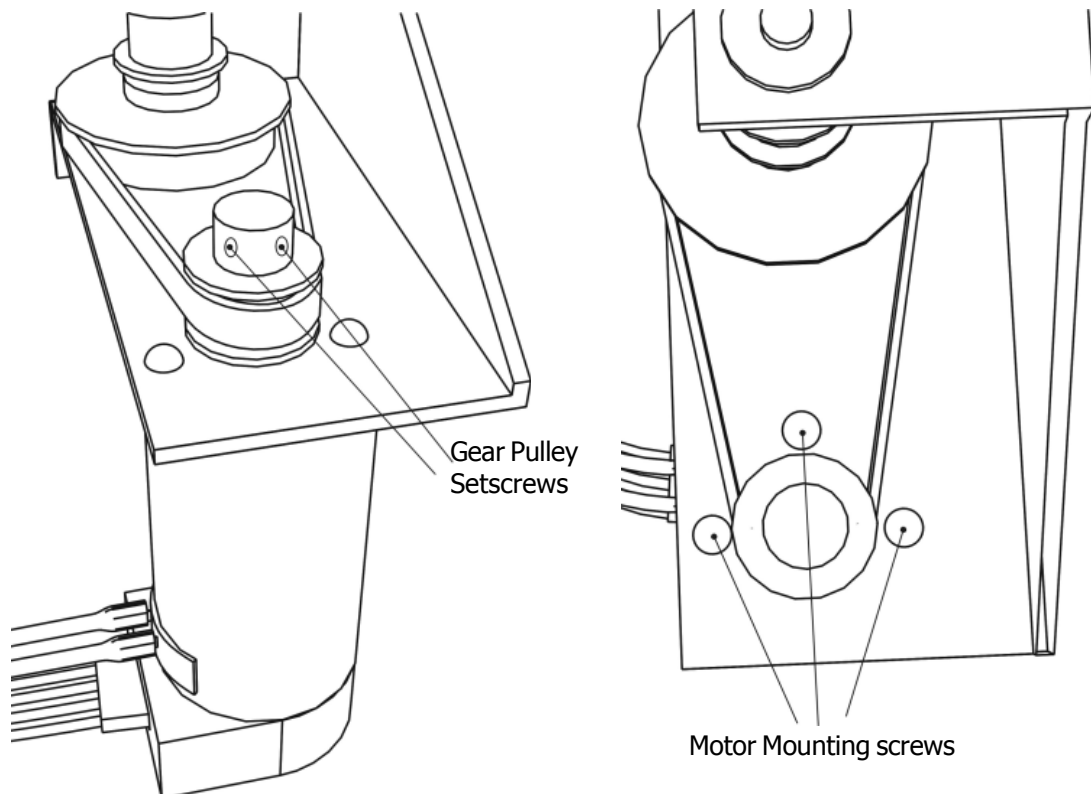


Fig. 5-8 Motor mounting screws, and gear setscrews

Y-Axis Belt Replacement:

1. Shut off the cutter and remove the power and computer data cables.
2. Remove the right (3 screws) and Left (2 screws) end covers. See *Removing the End Covers*.
3. Loosen the allen screw on the belt tensioner until the screw is not exposed. Do not remove the screw.
4. Grasp one of the metal “T”-connectors on the end of the Y-Axis belt and pull it out and toward the center of the carriage until it pops free. Make sure that the tensioner assembly is not tangled in the belt. Remove the other end of the belt from the carriage.
5. Pull the Y Axis belt through the holes in the left end plate. The belt will have to be threaded through the tensioner assembly. Once the belt is removed the tensioner assembly will have to be set aside because it is not attached to the end plate.
6. Pull the Y Axis belt through the holes in the right end plate. The belt may have to be threaded through the pulleys in the Y Axis transmission.
7. Thread the new Y Axis belt through the access slots in the right end plate and around the empty pulley in the transmission. It is very important to make sure that there are no twists in the belt and that the belt teeth properly engage the pulley. Continue to thread the belt through the holes in the left end plate and through the belt tensioner. Make sure that the belt teeth face the pulley wheel and that there are still no twists.
8. Insert one of the metal “T”-connectors into the grooves on the back of the carriage body.
9. Align the tensioner assembly with the indentations on the end plate and apply light tension to the belt by tightening the allen screw.
10. Move the carriage to the right side of the machine (Closest to the keypad).
11. To make sure the belt has the proper tension, use a fish scale that measures in Grams. place the hook (on the fish scale) around the belt. See *fig 5-9*.
12. Place a ruler on the bottom of the traverse extrusion, See *fig 5-9*.
13. Pull the fish scale to the 1” (One inch) mark on the ruler. The reading on the fish scale should read from 300 to 360 Grams. See *fig 5-10*.
14. Adjust the belt tensioner until the belt tension is correct.
15. If you can’t find a fish scale, the belt can be adjusted by hand. Tighten the tensioner until you feel there is enough tension on the belt.
16. Slide the carriage back and forth by hand. If you feel slipping the belt is too loose. If you hear “Clicking”, the belt is too tight.

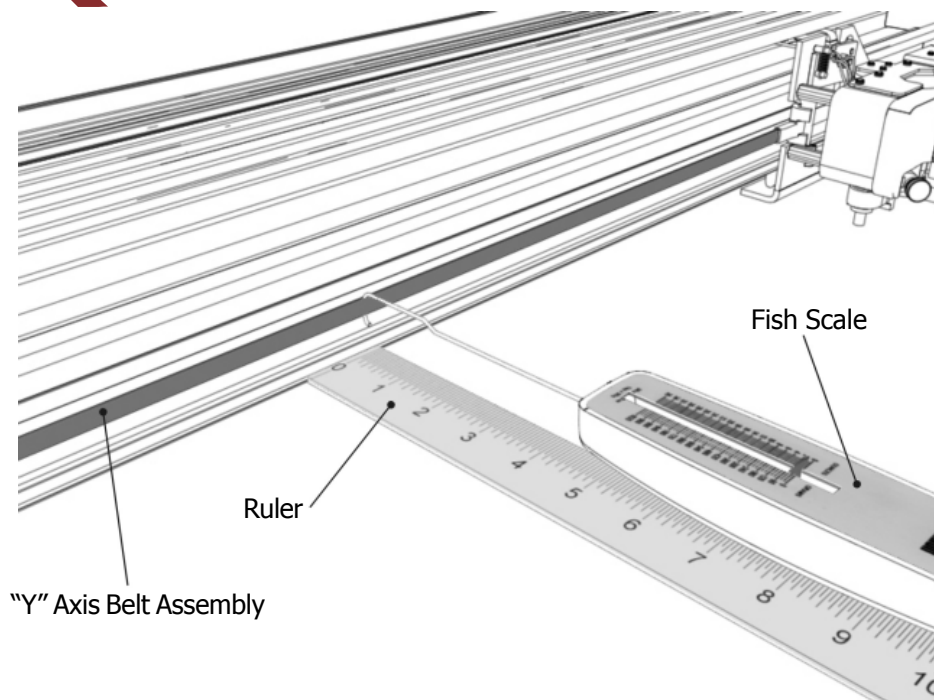


Fig. 5-9 Tensioning the "Y" axis belt assembly

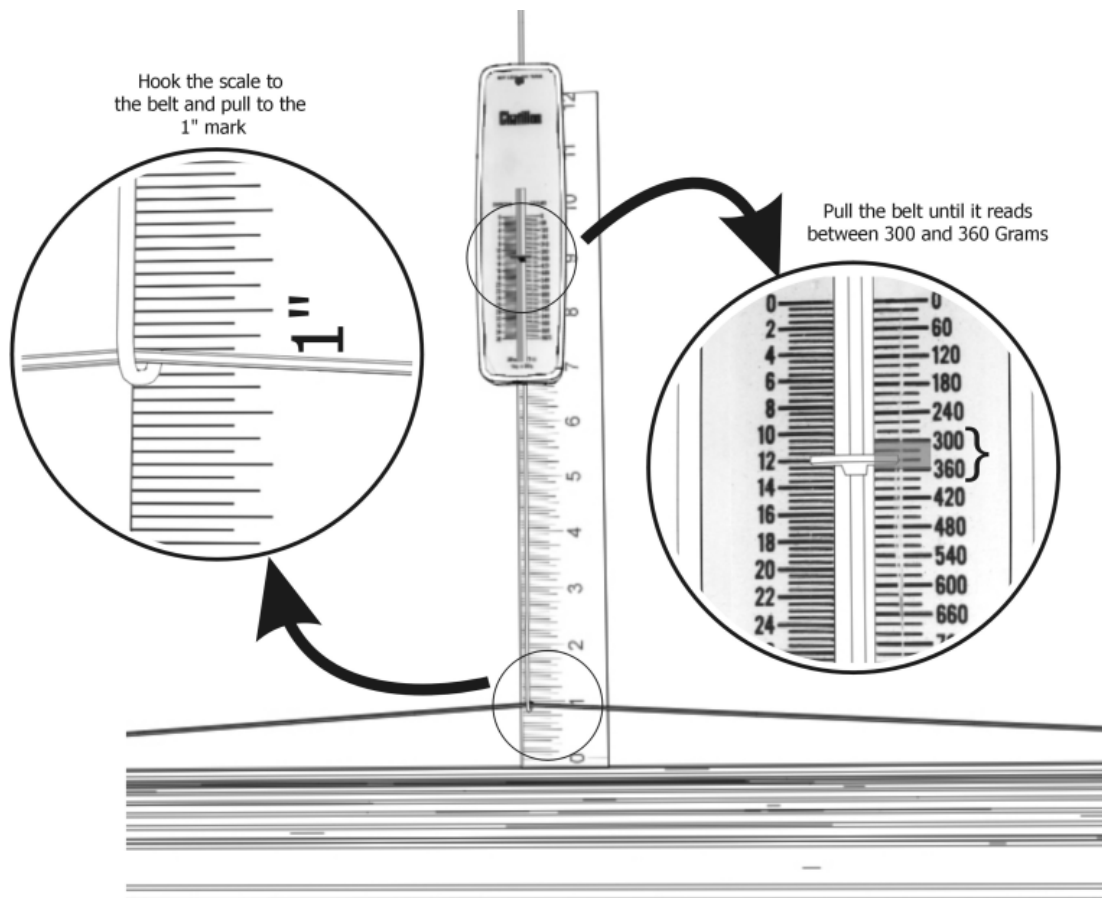
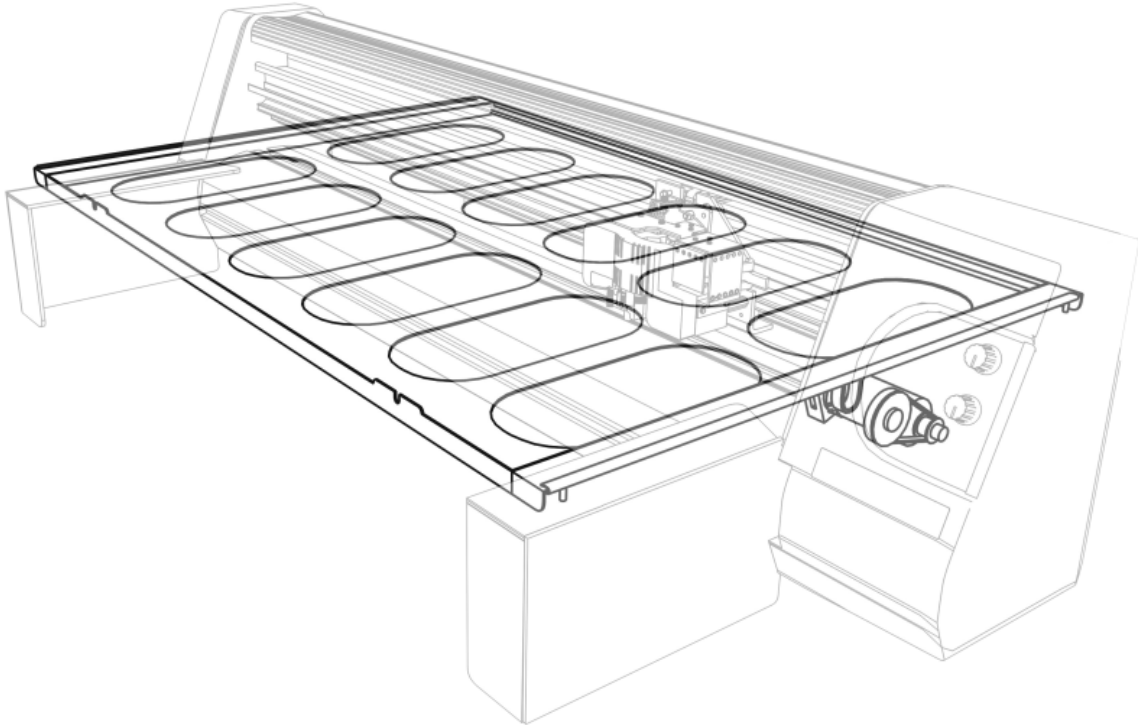


Fig. 5-10 Pulling the belt to 1", and measuring 300 to 360 Grams

X Axis Subsystem



X-Axis Transmission Assembly Replacement:



Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. It is important to note that the X Axis transmission consists of two pulleys, a motor, and the table assembly along with it's belts. There is no assembly to replace but the components can be changed if necessary.
2. Shut off the cutter and remove the power and computer data cable.
3. Remove the right (3 screws) end cover. *See Removing the End Covers above.*
4. To change either pulley loosen the set screws (See Fig. 5-11) pull the pulley off and replace with a new part. Reuse the set screws from the old pulley because there is Loctite residue on the threads. When tightening the set screws in the motor pulley make sure that one set screw contacts the shaft on the flat machined surface.
5. Plug the power cord into the 300 and into a wall outlet. Move the tray back and forth with the keypad keys while watching the X Axis belt. If there is excessive noise or if the belt is loose the phillips head screws that retain the motor can be

loosened and the motor can be adjusted slightly to achieve proper belt tension.

6. If the motor needs to be changed use the procedure below.
7. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.

If problems arise contact Ioline customer service.

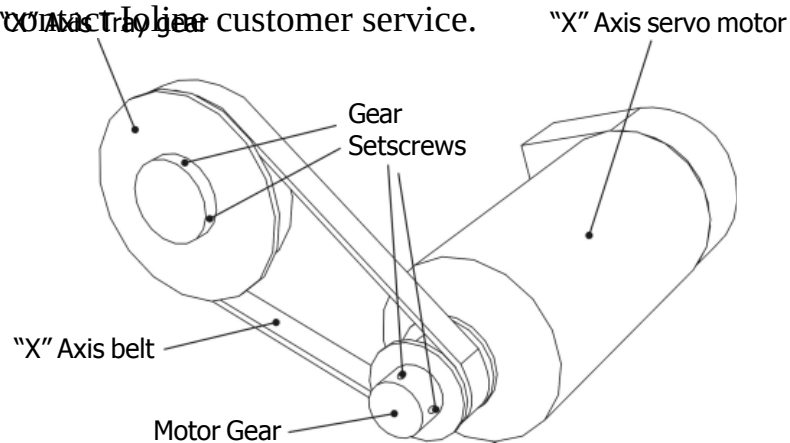


Fig. 5-11 "X" Axis motor, gears, and belt

X Axis Motor Replacement:

1. Shut off the cutter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover. See *Removing the End Covers* above.
3. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
4. Discharge any static electricity that has accumulated and remove all of the plugs on the logic board. Use the *Interconnect Diagram* in the *Appendix* section to find all of the connections.
5. Remove the logic board by loosening the phillips head screws and pulling the unit out of the track in the platen.
6. Disconnect the motor power cables (Red and black) from the base of the motor, and the black encoder plug with 4 wires at the base of the motor.
7. Remove the motor pulley and belt. Loosen and remove the three phillips head screws that hold the motor on the end plate.
8. Replace the motor and attach the pulley and belt. When tightening the set screws make sure that one set screw contacts the shaft on the flat machined surface.
9. Reconnect the power cables to the base of the motor with the red wire attached at 1 and the black wire attached at 2. Make sure to route the wiring through the plastic clips so that it is held away from moving parts and is accessible after the logic board is installed.

10. Install the logic board making sure that the rear edge fits into the proper track in the platen. Secure with the phillips screws.
11. Connect all of the plugs on the logic board. Use the *Interconnect Diagram* in the *Appendix* section to properly make all of the connections.
12. Plug the power cord into the 300 and into a wall outlet. Turn the power to the cutter on. Move the tray back and forth with the keypad keys while watching the X Axis belt. If there is excessive noise or if the belt is loose the phillips head screws that retain the motor can be loosened and the motor can be adjusted slightly to achieve proper belt tension.
13. Cable tie the wire bundles together to ensure that they do not interfere with moving parts and end cover replacement.
14. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
15. If problems arise contact Ioline customer service.

Table Assembly Replacement



Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) and left (2 screws) end covers. See *Removing the End Covers* above.
3. Loosen the (2) 11/32" nuts located on either side of the "X" axis tray gear. See *Fig. 5-12*

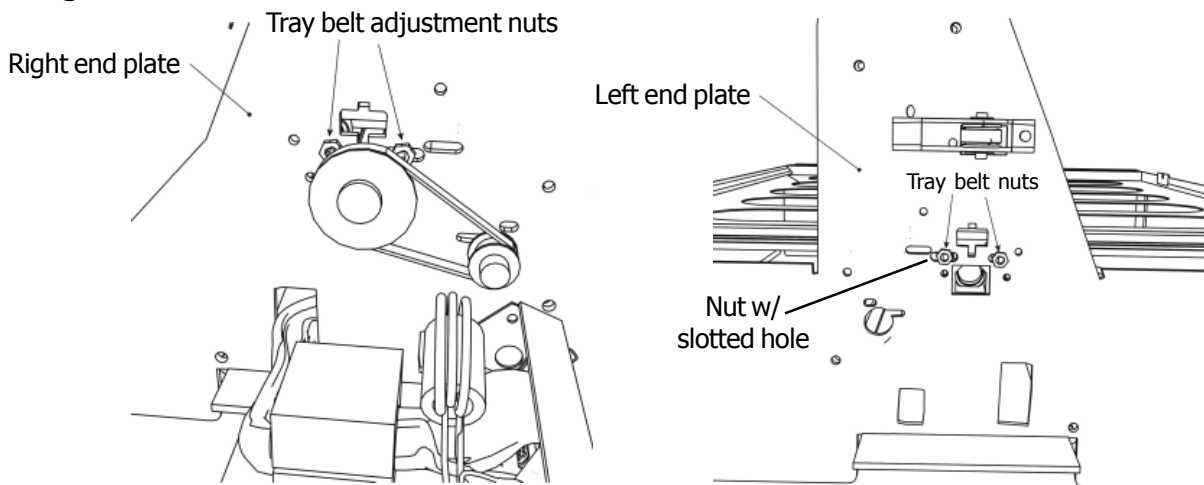


Fig. 5-12 Right and left end plates showing tray adjustment nuts

4. Unclip the belts under the right, and left side of the tray (One on each corner of the table). *See Fig. 5-13*

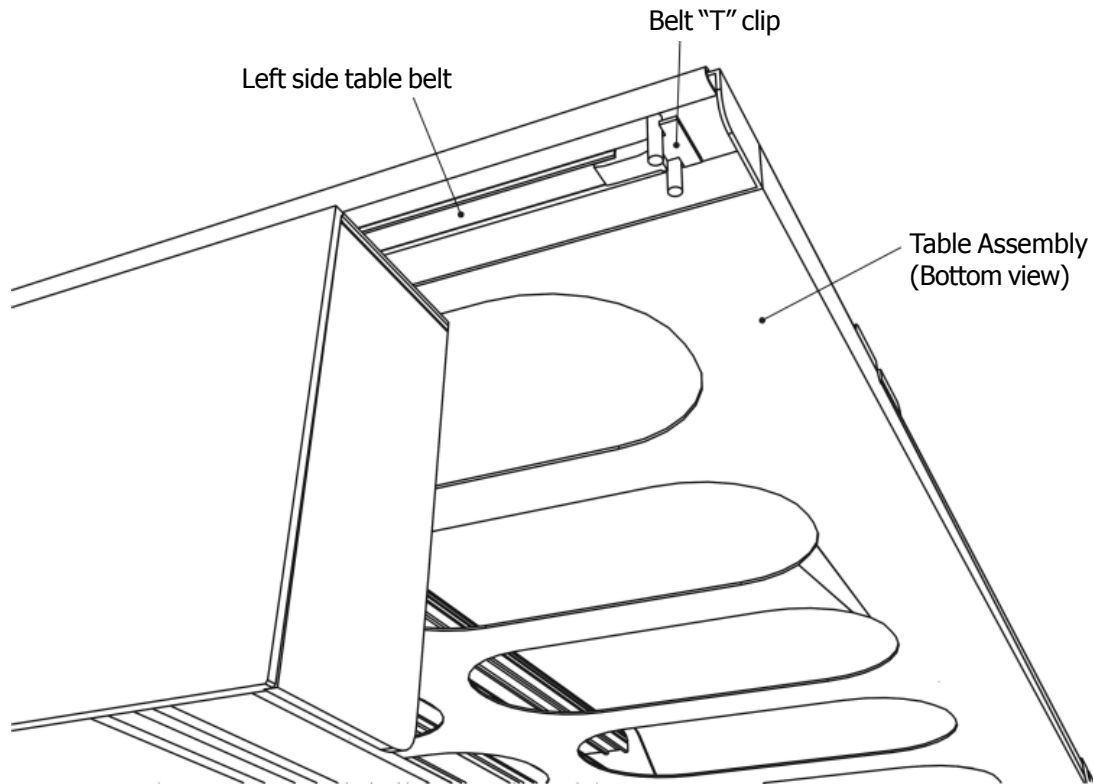
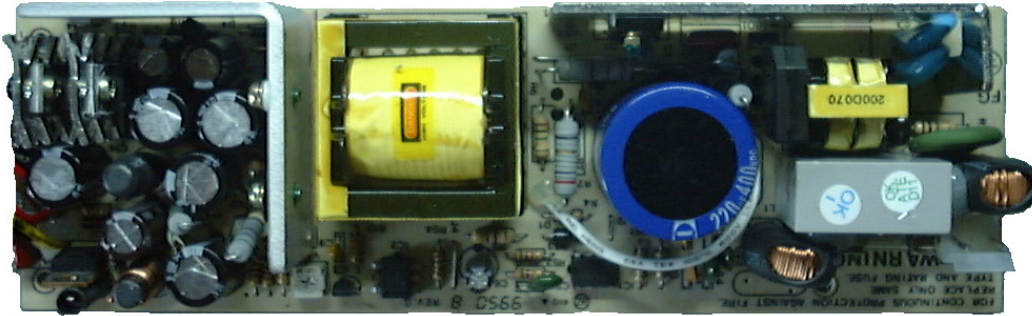


Fig. 5-13 Tray clip (*Right front clip shown with nuts removed*).

5. With all four belt ends detached from the underside of the table, slide the table out the front of the cutter.
6. Install the new table in reverse order. Be sure to get the sides of the table locked into the side wheels. The wheels should rest on the gray plastic rails located on the right and left.
7. Reattach the belt clips on all four corners of the underside of the table.
8. Tighten the belts by tightening the tray adjustment nuts on the right, and left end plates. *Refer to Fig. 5-12*. The nut with the slotted hole is the main tightening nut. Before tightening fully, push the nut in the direction of the back of the 300 cutter, then tighten.
9. Be sure the belts are "Taught" similar to a cars fan belt. If the belts are loose, cut quality will be affected.

10. Plug the power cord into the 300 and into a wall outlet. Turn the power to the 300 cutter on. Move the tray back and forth with the keypad keys while watching the X Axis belt. If there is excessive noise or if the belt is loose, the tray adjustment nuts can be adjusted slightly to achieve proper belt tension.
13. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
14. If problems arise contact Ioline customer service.

Power Supply



Power Supply Replacement



Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cable.
2. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
3. Discharge any static electricity that has accumulated and remove the power connector (brown and blue wires) from power supply. Unplug the output cable (J3 or J7) on the logic board. Use the *Interconnect Diagram* in the *Appendix* section as a location guide.
4. Remove the 4 screws that hold the unit in the metal pan and pull the assembly out.
5. Install the new assembly with the same hardware removed above. Make sure that the output cable (Big plug) face the logic board. Hint: The screw holes only line up one way on the bracket.
6. Connect the power plug to the supply and the output cable to the logic board. They only fit on one way. Use the *Interconnect Diagram* in the *Appendix*.
7. Plug the power cord into the 300 and into a wall outlet. Test all of the functions with the keypad.
8. Reconnect the computer data cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
9. If problems arise contact Ioline customer service.

Rear Panel Replacement

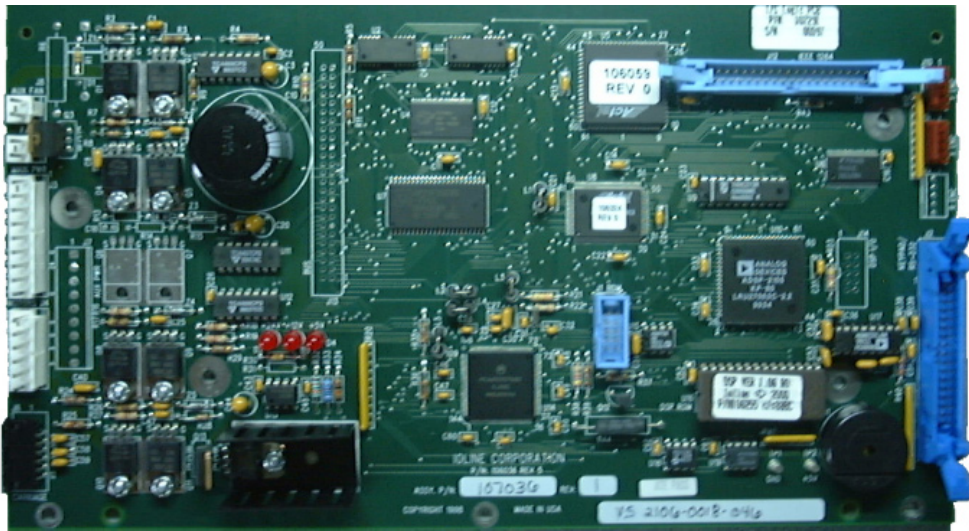


Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cable.
2. Remove the right (3 screws) end cover by following the *Removing end covers* earlier in this chapter.
3. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
4. Cut plastic cable ties around wires.
5. Remove the gray ribbon cable (blue socket at J2 near the right end plate) by pushing the blue tabs away from the center of the connector. The plug should be easy to pull out. Remove the Light blue ribbon cable (Light blue socket at J12). Unplug the power supply cable (Brown and Blue wires) located on the side away from the logic board.
6. Pull the wires through the hole in the end plate. The encoder wires may have to be moved out of the way.
7. Disconnect the gray ribbon cable from keypad circuit board connector. Cut the cable tie that holds the wire bundle to the ground wire.
8. Loosen and remove the two nuts holding the rear panel assembly to the right end plate.
9. Attach the new rear panel assembly making sure that the power switch faces the rear of the plotter.
10. Connect the gray ribbon cable to the keypad assembly with the red stripe (pin 1) on the edge closest to the mounting holes. Hint: The cable is keyed to fit one way in the socket.
11. Push the logic board plug through the hole in the end plate. The encoder wires may have to be moved out of the way.
12. Open the blue tabs away from the center of the connector before inserting the gray ribbon cable into the blue socket at J2. Gently push the plug into the slot. The tabs will snap closed when the plug is properly seated. The red stripe (pin 1) on the edge should be closest to front of the machine. Reattach the light blue ribbon cable with the red stripe (pin 1) on the closest edge to the keypad.

13. Cable tie the wire bundles together to ensure that they do not interfere with moving parts and end cover replacement.
14. Plug the power cord into the 300 and into a wall outlet. Test all of the keypad keys and make sure that all of the functions are working.
15. If problems arise, contact Ioline Customer Service.

Electronic Sub-Systems



Main Logic Board Replacement



Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cable.
2. Perform the procedures in *Removing the Bottom Cover for Internal Access* above.
3. Mark all of the main logic board connectors with a felt tip pen before disconnecting them. This will make it easier to correctly install the connectors after inserting the new logic board.
4. Discharge any static electricity that has accumulated and remove all of the plugs and connections on the logic board. Use the *Interconnect Diagram* in the *Appendix* section as a location guide.

5. Remove the logic board by loosening the four phillips head screws and pulling the unit out of the track in the platen.
6. Replace the new logic board making sure to insert the top edge into the support track in the platen. Insert and tighten the four phillips screws from above. The fasteners only need to be snug and can damage the logic board if over tightened.
7. Connect all of the plugs on the logic board. Use the *Interconnect Diagram* in the *Appendix* section and the notes from step 4 as a guide.
8. Plug the power cord into the 300 and into a wall outlet. Power the machine on using the resetting procedure below. Test all of the functions of the keypad.
9. Reconnect the serial cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
10. If problems arise contact Ioline customer service.

Resetting the Factory Defaults

If you have replaced the logic board, or the 300 System is acting wierd, the machine should be reset to factory defaults. There are two ways to restore the factory default system parameters.

Default Reset Functions	Result
Hold down the Start/Stop key while turning on the power	Resets all factory parameter defaults but keeps the X/Y calibration values.
Hold down the Up Arrow key while turning on the power	Resets all factory parameter defaults and clears the X/Y calibration values. This option should only be used when replacing a ROM chip.

Keypad Replacement



Electrostatic discharge preventative measures must be adhered to during all assembly replacement procedures.

1. Shut off the plotter and remove the power and computer data cables.
2. Remove the right (3 screws) end cover. See *Removing the End Covers* above.
3. Loosen and remove the two nuts holding the keypad assembly to right end plate.

4. Disconnect the gray ribbon cable from keypad circuit board connector.
5. Remove keypad assembly.
6. Connect the gray ribbon cable to the new keypad assembly with the red stripe (pin 1) on the edge closest to the mounting holes.
7. Fasten the new keypad assembly to the end plate with the hardware from above.
8. Plug the power cord into the 300 and into a wall outlet. Test all of the keypad keys and make sure that all of the functions are working. When the carriage moves on the traverse extrusion watch the Y Axis belt.
9. Reconnect the serial cable and perform test plots. Reassemble the 300 in the reverse order that it was disassembled. See *General Disassembly Procedures* above.
10. If problems arise contact Ioline customer service.

Installing new Firmware



Failure to follow these directions explicitly may cause permanent damage to the Logic Board and may cause the plotter to malfunction.

1. Make sure the 300 cutter is powered on, and the computer data cable is plugged in. Press the “Set Origin” button on the keypad of the cutter.
2. Start the Ioline Control Center. See *Chapter 3 Setup & Operation for help with the Ioline Control Center*.
3. When the Control Center window is open, click on the “Options” drop down menu, and click “Install New Firmware Version”.
4. When the Install new firmware window opens, click on the “Install” button.
5. A dialog box will open asking for the location of the “BIN” file (This file is available through the Ioline webs ite at www.ioline.com, or through Ioline Customer Service). Locate the file, and click “OK”.
6. The LED on the keypad of the cutter will blink Red as the new firmware installs.
7. After installation is complete, the Control Center will close automatically, and the 300 cutter should be turned off, and reset back to factory defaults before sending any files to it. See *Reseting the factory defaults on Pg. 85*.
8. If a problem should arise, and the cutter won’t power up after installation of the new firmware contact Ioline Customer Service for instructions.



Chapter 6 Drawings, and Bulletins

106708

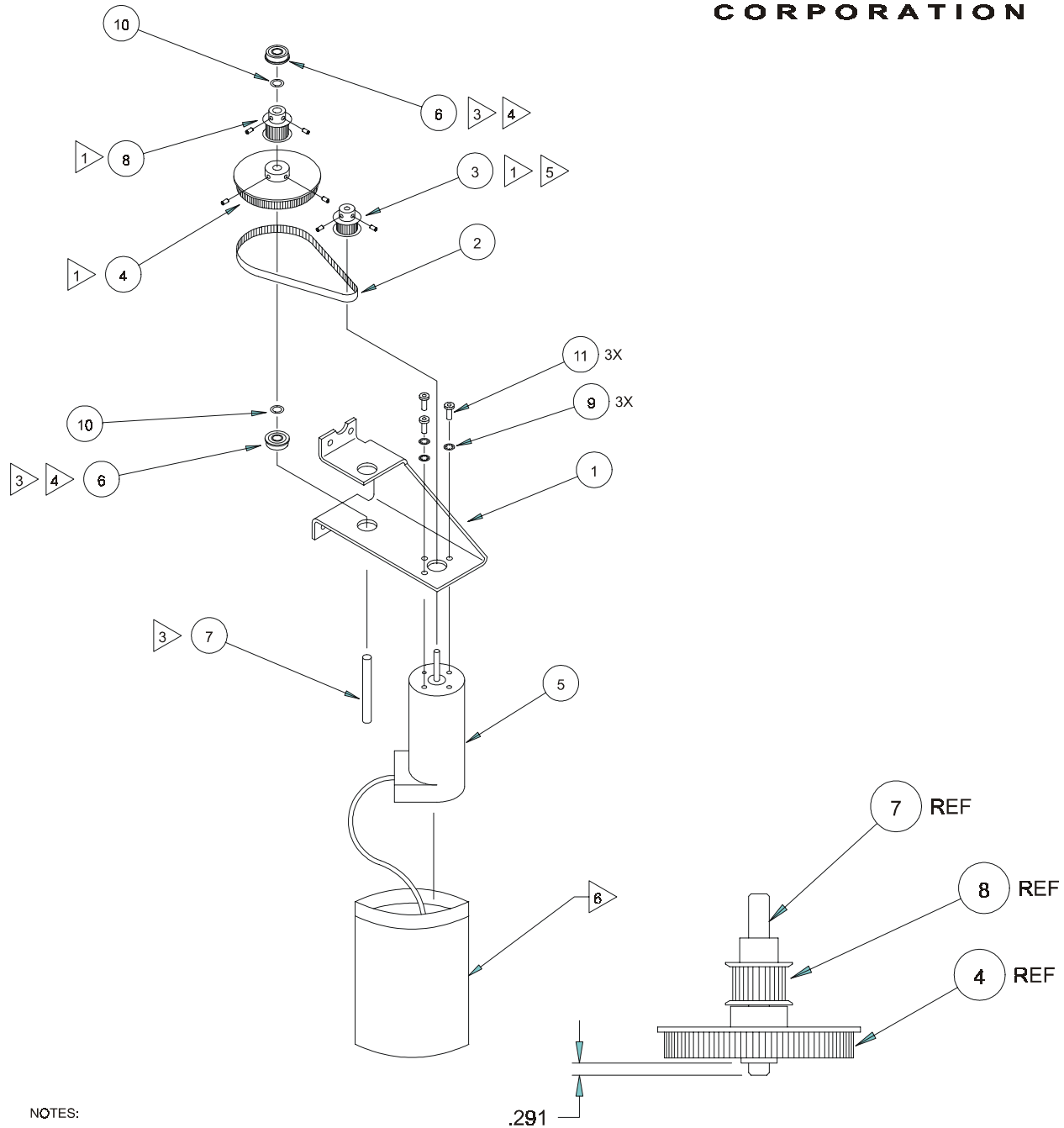


Belt Tensioner (Bill of materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
2	106698	BRACKET, TENSIONER, SC98	1
3	106696	IDLER, TENSIONER, I/S	1
4	106431	SHAFT, .25OD, TENSIONER, SC98	1
5	103825	SPACER, SHAFT	2
8	100316	BEARING, BALL, .25ID, .625OD, .196	2
6	102222	RING, RETAINING, E-CLIP, 1/4	2
7	100046	SCREW #8-32, 1.25 LG, SHC, FULL THD	1

"Y" Axis Transmission

106817



NOTES:

- 1 SECURE ALL PULLEY SET SCREWS WITH LOCTITE 222. BE SURE ONE SET SCREW IS AGAINST FLAT ON SHAFT.
- 3 CLEAN MATING SURFACES OF BEARINGS, ITEM 6, AND BRACKET, ITEM 1, WITH LOCTITE PRIMER N. SECURE BEARINGS TO PLATES WITH LOCTITE 609.
- 4 ADD A SMALL AMOUNT OF LOCTITE THREAD LOCKER 290 TO INNER RACE ID OF BEARINGS, ITEM 6. CAUTION: ID OF BEARINGS, ITEM 6. WIPE OFF ALL EXCESS LOCTITE. DO NOT ALLOW ANY TO GET INSIDE BEARING.
- 5 INSTALL PULLEY SO THAT THE GAP BETWEEN THE PULLEY FLANGE AND BRACKET IS $.100 \pm .010$.
- 6 MOTOR, ITEM 5, IS STATIC SENSITIVE. COVER MOTOR AND CONNECTOR WITH 3 X 5 STATIC BAG AND SECURE WITH A RUBBER BAND.



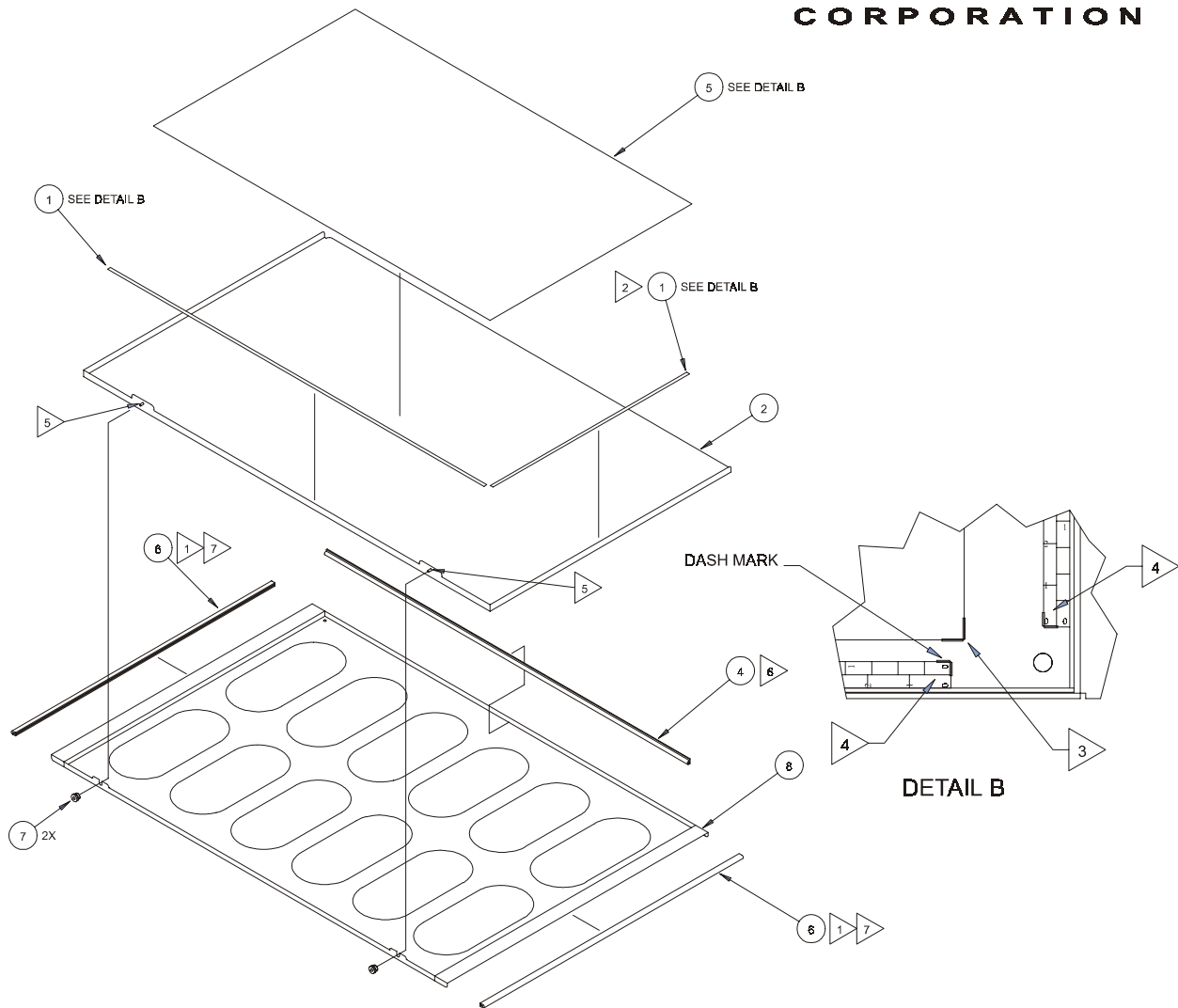
CAUTION
SENSITIVE ELECTRONIC DEVICES

DO NOT SHIP OR STORE NEAR STRONG
ELECTROSTATIC, ELECTROMAGNETIC,
MAGNETIC OR RADIOACTIVE FIELDS

“Y” axis Transmission (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	105935	BRACKET, Y TRANS, SUMMIT 97	1
2	105953	BELT, .080 X 1/4 X 110T	1
3	105933	PULLEY, 16T X .080 X 1/4	1
3	107346	PULLEY, 5MM BORE, 16T X .080 X 1/4	1
4	105934	PULLEY, 60T X .080 X 1/4	1
5	106816	MOTOR, SERVO, 24V	1
5	107347	MOTOR, 5MM SHAFT, SERVO, 24V	1
6	100317	BEARING, BALL, .25ID, .625OD, .196	2
7	104830	PIN, Y DRIVE	1
8	104730	PULLEY, .080 X 3/8 X 25T	1
9	100080	WSHR, #6, LOCK, EXT STAR	3
10	100111	SPACER, .254ID, .375OD, .030LG, GOL	2
11	104975	SCREW #6-32, .375 LG, BTN HD	3

Table Assembly 106894



NOTES:

- 1 ADHERE PROTECTIVE STRIP 6 TO TRAY 8 WITH LOCTITE 401.
- 2 CUT TO THE 18.25" MARK ON THE RULER.
- 3 ALIGN CORNERS OF ADHESIVE SHEET 5 TO THE CORNER MARKS ON THE TRAY 2
- 4 ALIGN RULER 1 ALONG THE WALL OF TRAY 2 . POSITION RULER AS SHOWN IN DETAIL B (USING DASH MARKS).
- 5 AFTER THUMB NUT 7 IS TURNED ONTO THE THREADED STUD, CRIMP THREAD WITH PLIERS SO THE THUMB NUT CAN NOT BE REMOVED. (NOTE: THE THUMB NUT MUST BACK OUT FAR ENOUGH TO REMOVE AND INSTALL THE TRAY).
- 6 CUT TO 32.50.
- 7 CUT TO 23.05.

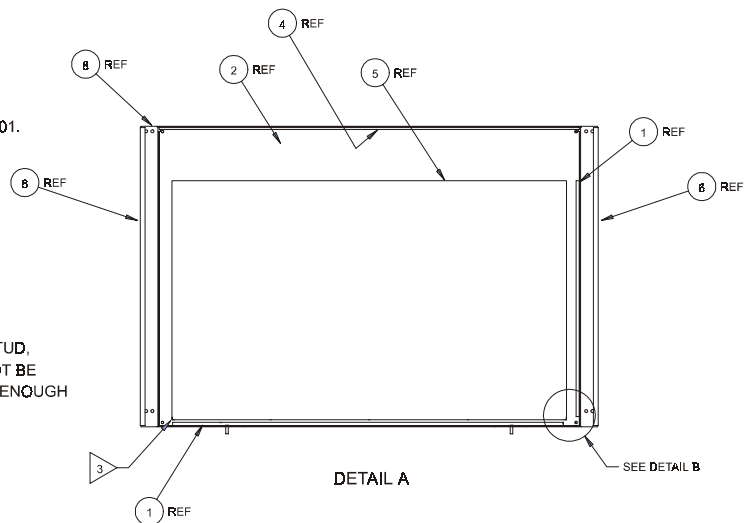
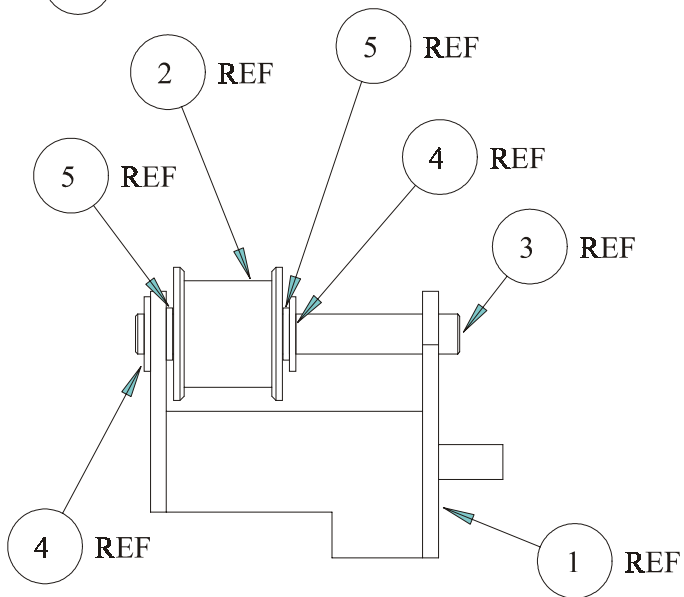
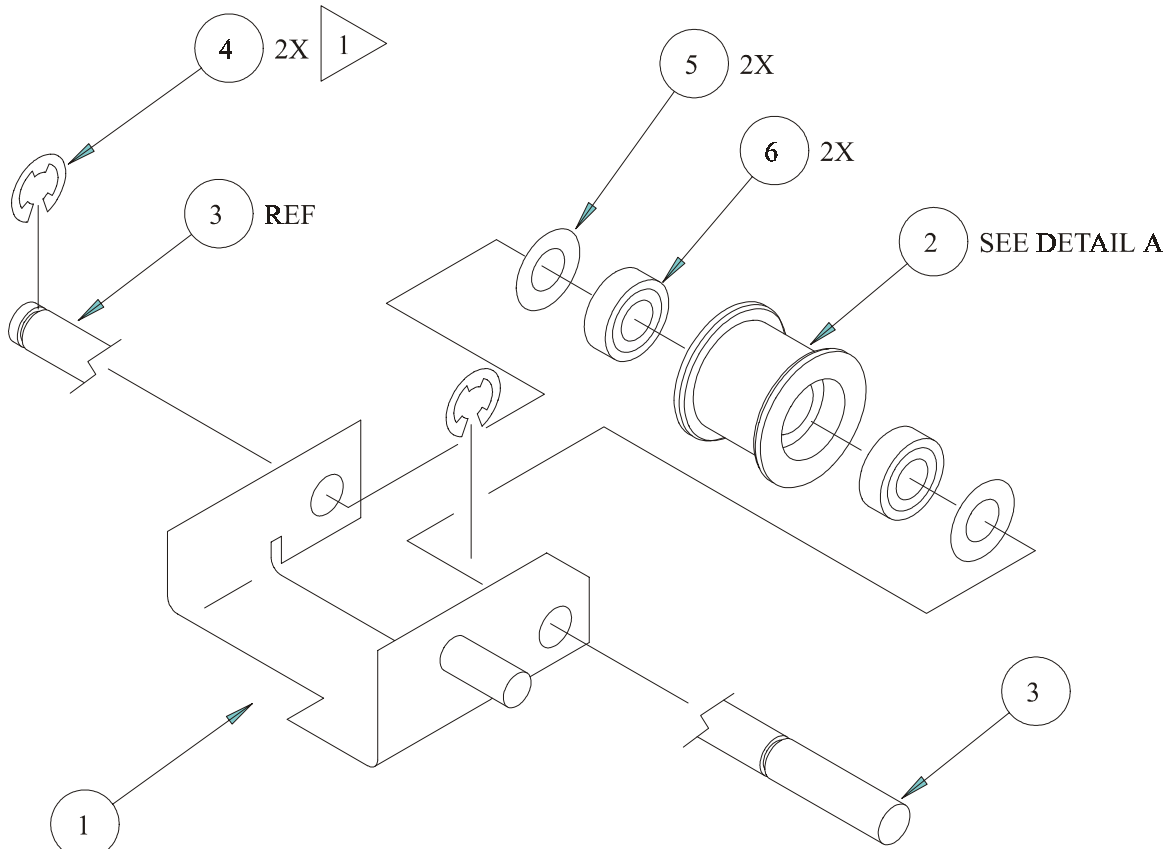


Table Assembly (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106895	RULER, 30 INCH	2
2	106893	TRAY, 300	1
4	106080	WEATHERSTRIPPING	32.5
5	106909	SHEET, ADHESIVE, HT, 18.5 X 30.5	1
6	106252	STRIP, PROTECTIVE	48
7	106130	NUT, #10-32, ROUND THUMB	2
8	106892	TABLE, APPLI-K 99	1

Tray Belt Idler Assy (Right Side)

106901



DETAIL A

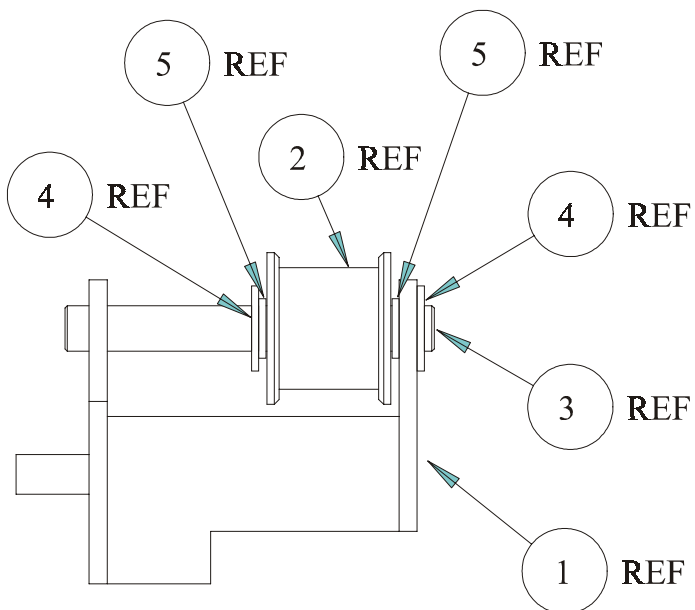
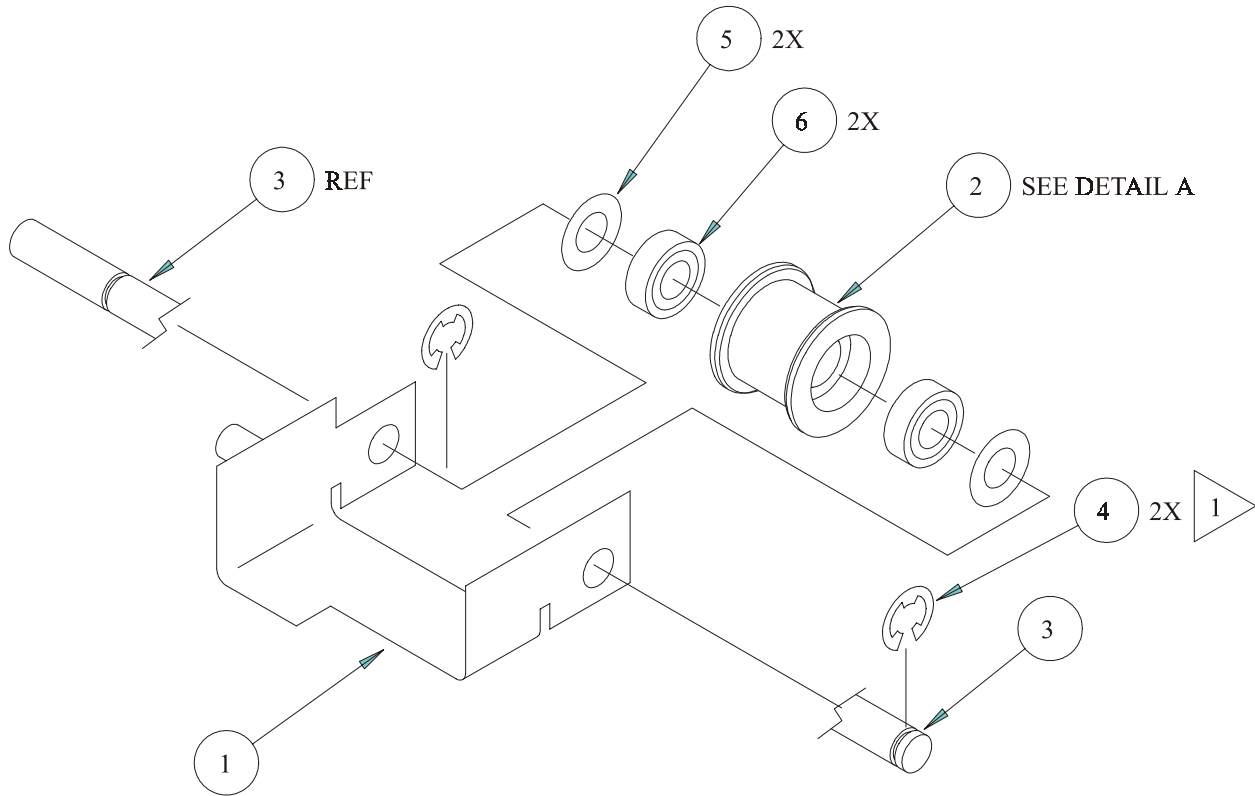
NOTES:

1 INSTALL THIS E-CLIP FIRST.

Tray Belt Idler Assembly - Right side (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106821	BRACKET, IDLER, X-DRIVE, RIGHT	1
2	106890	IDLER, X-DRIVE, APPLI-K 99	1
3	106891	SHAFT, IDLER, X-DRIVE, APPLI-K 99	1
4	103852	RING, RETAINING, E-CLIP, 3/16	2
5	106530	WSHR, .195 ID, .245 OD, .03 THK	2
5	106626	WSHR, .195 ID, .245OD, .02 THK	2
6	106896	BEARING, .187 ID, .375 OD, .125 W	2

Tray Belt Idler Assy (Left Side) 106902



DETAIL A

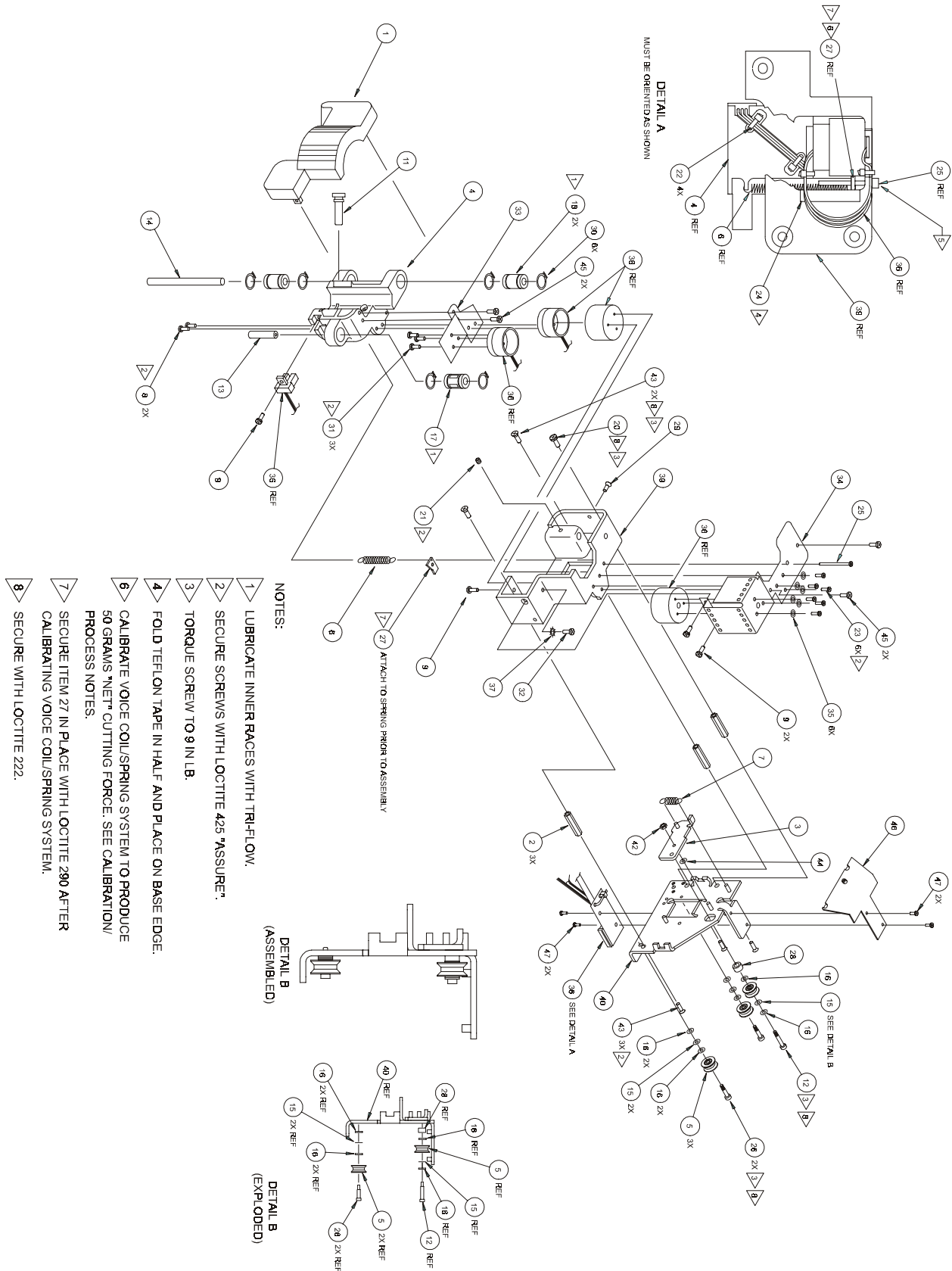
NOTES:

- 1 INSTALL THIS E-CLIP FIRST.

Tray Belt Idler Assembly - Left Side (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106822	BRACKET, IDLER, X-DRIVE, LEFT	1
2	106890	IDLER, X-DRIVE, APPLI-K 99	1
3	106891	SHAFT, IDLER, X-DRIVE, APPLI-K 99	1
4	103852	RING, RETAINING, E-CLIP, 3/16	2
5	106530	WSHR, .195 ID, .245 OD, .03 THK	2
5	106626	WSHR, .195 ID, .245OD, .02 THK	2
6	106896	BEARING, .187 ID, .375 OD, .125 W	2

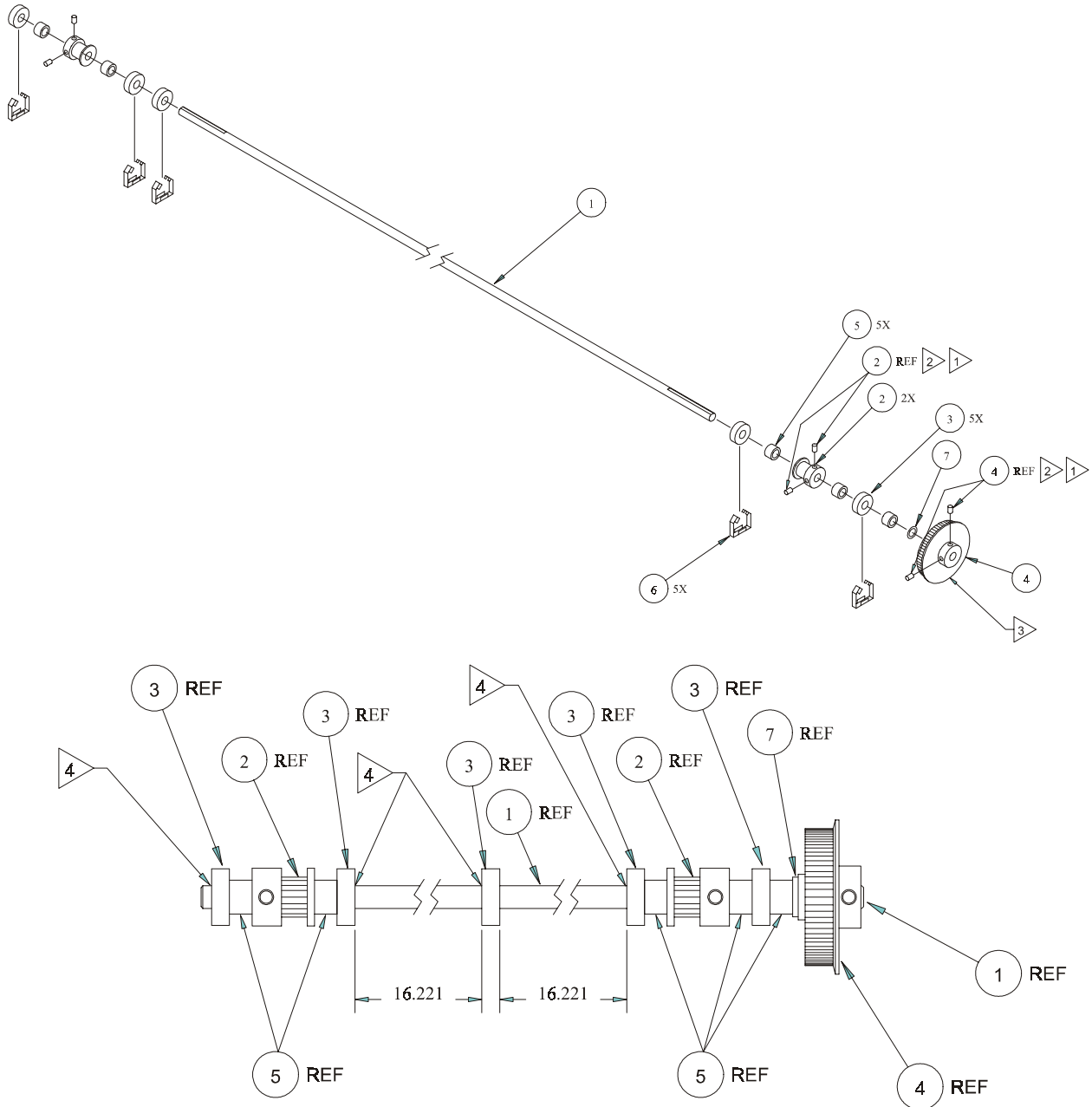
Carriage Assembly 106905



Carriage Assembly (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	105554	COVER, MOLDED, MACHINED	1
2	106934	STANDOFF, F/F, #8-32, 1.0 LG	3
3	106998	ARM, CARRIAGE, APPLI-K 99	1
4	106213	JAW, MOLDED, MACH., APPLI-K	1
5	106230	WHEEL, CARRIAGE, SC98	3
6	105859	SPRING, EXTENSION, SHORT	1
7	106462	SPRING, EXTENSION, .25 OD, .037 DIA	1
7	107178	SPRING, EXT, .25 OD, .04 ID, 75 LG	1
11	104716	SCREW, THUMB, 1/4-20, 1.00	1
12	106526	SCREW, SHOULDER, .187 DIA, .5625 LG	1
13	105546	PIN, CARRIAGE, SHORT	1
14	105545	PIN, CARRIAGE, LONG	1
17	105543	BUSHING, BALL, .25"	1
18	105544	BUSHING, BALL, PREC,.25"	2
25	106041	SCREW, #4-40, .875 LG, PHP	1
26	106073	SCREW, SHOULDER, .187 DIA, .375 LG	2
27	105860	BRACKET, CALIBRATION, CARRIAGE	1
28	106115	SPACER, .188 ID, .313 OD, .188 LG	1
32	106214	SCREW #4-40, .250 LG, HEX	1
33	106208	BRACKET, LOWER VCM	1
34	106210	BRACKET, UPPER, VCM	1
36	106933	PCB ASSY, CARRIAGE, APPLI-K 99	1
39	106906	BASE, MOLDED, MACHINED, APPLI-K 99	1
40	106996	BASE, CARRIAGE, APPLI-K 99	1
43	101581	SCREW #8-32, .375 FHP, BLACK	5
44	107274	WSHR, .5 OD, .145 ID, .010 T, PTFE	1
45	104560	SCREW #4-40, .250 PHP, SEMS	4
46	107327	COVER, CARRIAGE, TOP, 200/300	1
47	107328	SCREW #4-40, .187 LG, PHP SEMS	4
8	104712	SCREW #4-40, .312, PHP NYLON	2
9	104337	SCREW #4-40, .375 PHP, SEMS	3
15	106626	WSHR, .195 ID, .245OD, .02 THK	3
16	106530	WSHR, .195 ID, .245 OD, .03 THK	6
20	104008	SCREW #8-32, .375 LG, PHP SEMS	1
21	100037	SCREW #8-32, .187 LG, SH SET, CUP	1
22	103726	TYRAP, .1 IN X 3 IN, BLACK	4
23	101860	SCREW #2-56, .312 LG, PHP	6
24	104471	TAPE, UHMW, .43 WIDE	1.25
29	105547	SCREW #4-40, .375 LG, FHS	1
30	100333	RING, RETAINING, 1/2IN.	6
31	106314	SCREW, #4-40, .25 LG, PHP, NYLON	3
35	103896	WSHR, #2, FLAT, STEEL	6
37	100074	WSHR, #4, LOCK, INT STAR	1
38	106353	SCREW, 2-56 X .188 PHP, SEMS	3
42	106532	NUT, #6-32, HEX, NYLOCK	1

Shaft Assembly 106903



NOTES:

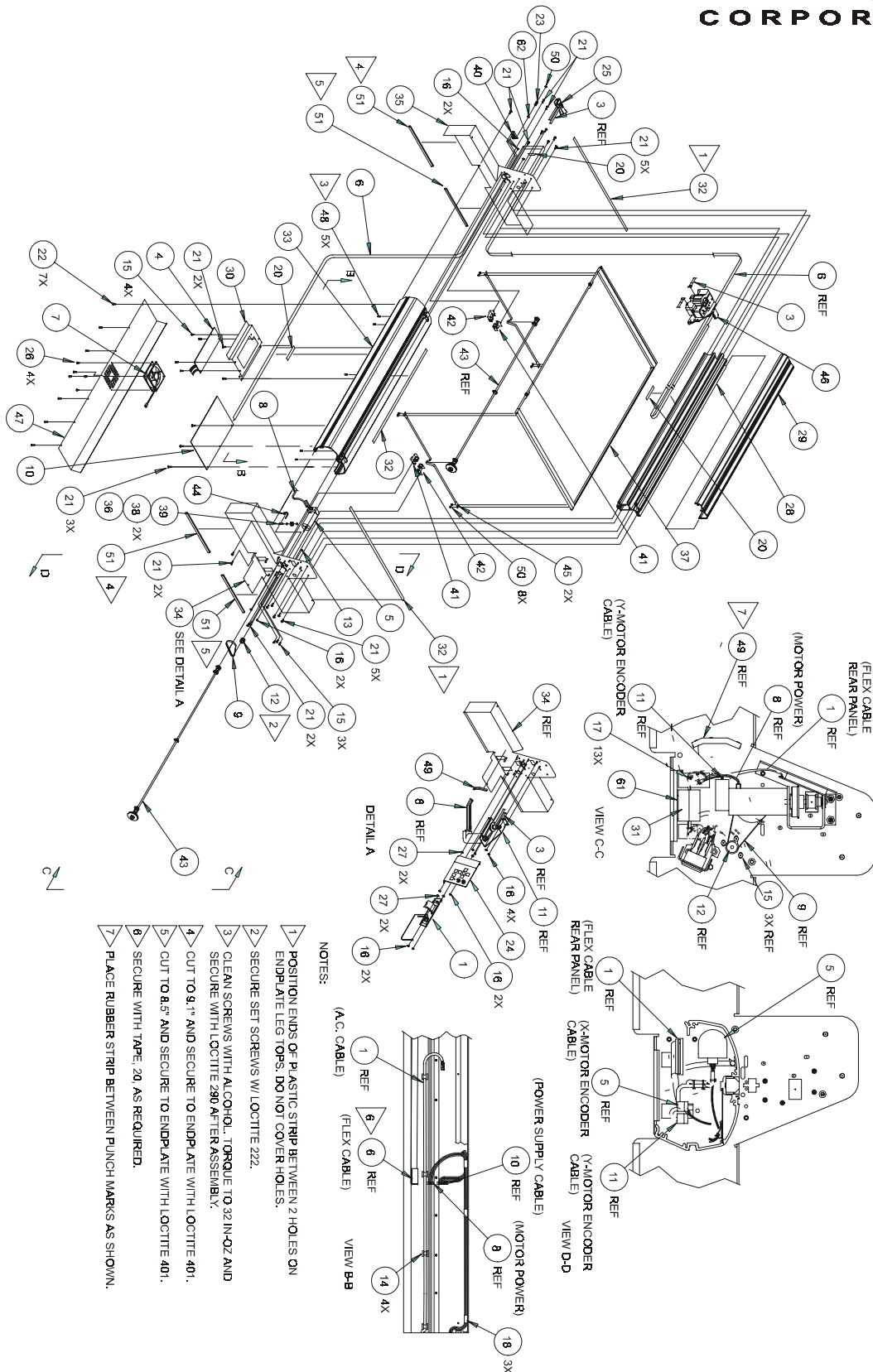
- 1 INSTALL ONE SET SCREW WITH FLAT ON SHAFT.
- 2 INSTALL ALL SET SCREWS WITH LOCTITE 222.
- 3 INSTALL LABEL PRINTED WITH "P/N 106903, 300".
- 4 CLEAN BEARING INNER RACE, ITEM 3, AND GRITSHAFT PIN, ITEM 1, THOROUGHLY WITH ALCOHOL. APPLY LOCTITE 406 "PRISM" TO BOTH. CAUTION: DO NOT GET LOCTITE INSIDE BEARING.

Shaft Assembly (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106898	SHAFT, .250 OD, 37.00 LG	1
2	106908	PULLEY, 18 X .080 X 3/8	2
3	100316	BEARING, BALL, .25ID, .625OD, .196	5
4	105934	PULLEY, 60T X .080 X 1/4	1
5	100823	SPACER, .255ID, .38OD, .250LG	5
6	104820	CLIP, BEARING	5
7	106221	WSHR, .25 ID, .375 OD, .03 THK	1

System 300 Chassis Assembly

106882



System 300 - Chassis Assembly (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
4	104753	POWER SUPPLY	2
15	104713	SCREW #6-32, .375, PHP SEMS	7
23	103388	SPRING, COMPRESSION, .240 OD, .032	1
29	106714	COVER, DUST, SC98, 30	1
30	106716	PLATE, POWER SUPPLY, SC98, 30	1
30	104754	PLATE, POWER SUPPLY	1
30	106849	BRACKET, POWER SUPPLY, I/S-600/28	1
32	106813	STRIP, TEFLON, 22.25 X .500 X.04THK	3
36	106230	WHEEL, CARRIAGE, SC98	1
37	106894	TABLE ASSY, APPLI-K 99	1
39	106897	SHAFT, .187 OD, .77 LG	1
40	106900	TENSIONER ASSY, APPLI-K 99	1
41	106901	IDLER ASSY, X-DRIVE, RIGHT	2
42	106902	IDLER ASSY, X-DRIVE, LEFT	2
45	106904	BELT ASSY, X-DRIVE	2
46	106905	CARRIAGE ASSY, 300/200	1
13	100705	PAD, PEN CAP, 1/4 DIA	1
14	103026	CONN, CABLE CLIP, .18 DIA	4
15	100026	SCREW #6-32, .5 LG, PHP, SEMS	7
16	104013	NUT, #8-32, KEP	12
17	103027	TYRAP, .1 IN X 5 3/4 LG	13
18	100279	CONN, CABLE CLIP	3
19	104152	CLIP, CABLE, .50 DIA	1
20	103740	TAPE, FOAM, .5 IN, .025 THICK	12
21	104180	SCREW, #8, .50 LG, SLF TAP, PHP, SE	23
22	104590	SCREW #8, .50 LG, ST, FHP	7
26	106652	RIVET, PLASTIC, .2 GR X .169 OD	4
27	106241	WSHR,#8-32,.190 ID,.416 OD,.080THK	4
38	106530	WSHR, .195 ID, .245 OD, .03 THK	2
44	103726	TYRAP, .1 IN X 3 IN, BLACK	1
48	105068	SCREW #10-32, .625 LG, SHC	5
48	102726	SETSCREW #10-32, .75 LG, STEEL	5
49	107042	STRIP, FILLER, RUBBER	2.6
50	100089	NUT, #8-32, HEX, NYLOCK	9
51	106252	STRIP, PROTECTIVE	36
61	106528	TAPE, DOUBLE COATED, 1.25 W	2
62	103973	WSHR, .170 ID, .375 OD, .035TH, SS	1
1	106507	ASSY, REAR PANEL, SC98	1
1	106867	REAR I/O PANEL ASSY, I/S-600	1
3	106511	ASSY, Y-BELT, SC98, 30	1
4	104753	POWER SUPPLY	1
5	106816	MOTOR, SERVO, 24V	1
5	107347	MOTOR, 5MM SHAFT, SERVO, 24V	1
6	105259	CABLE, FLEX, 88/30	1

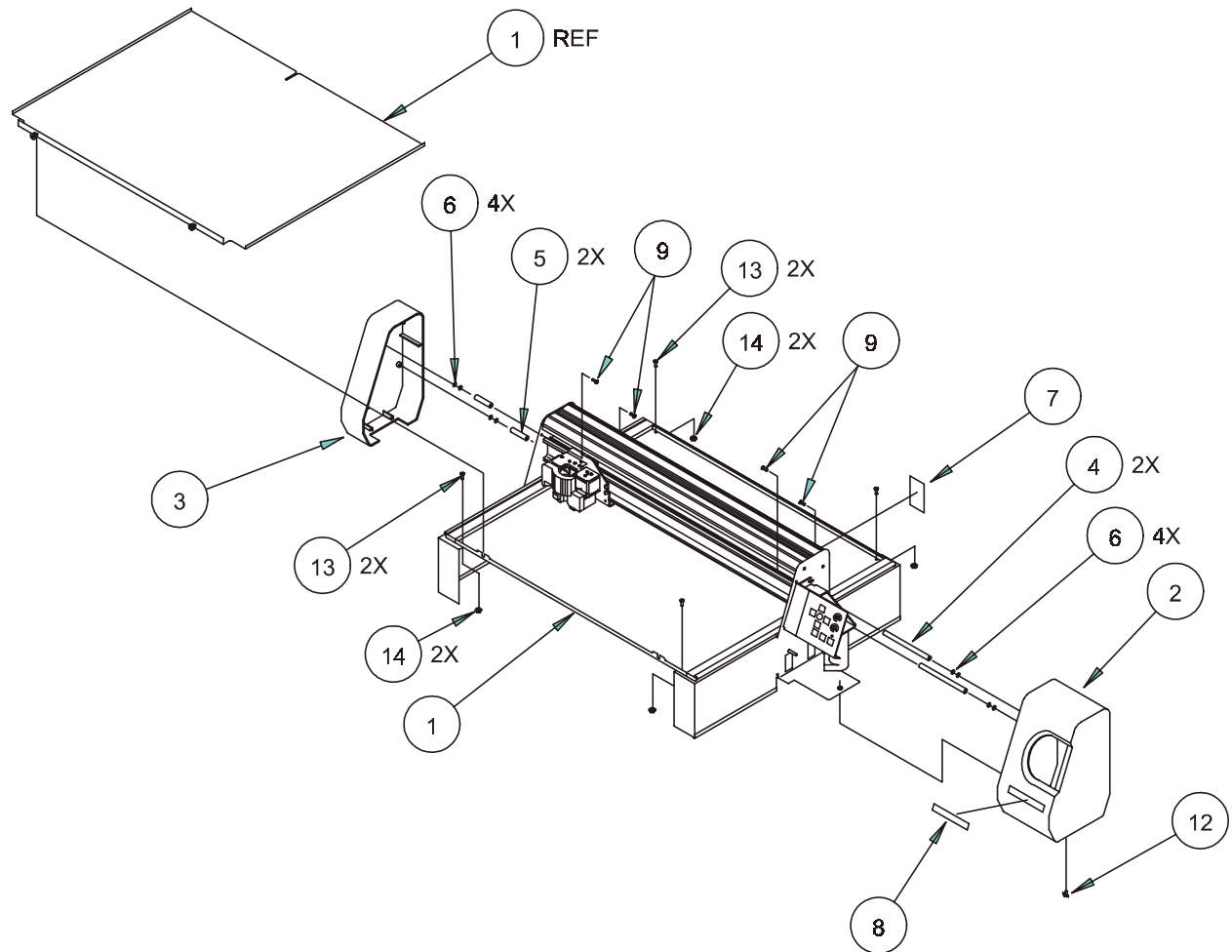
System 300 - Chassis Assembly (Bill of Materials) Cont...

7	104745	FAN ASSY, W/ CABLE	1
8	106549	ASSY, CABLE, MOTOR POWER, SC98	1
9	106550	BELT, .080 X 1/4 X 100T	1
10	106930	PCB ASSY, 68331, APPLI-K, PROG	1
10	107305	PCB ASSY, 68331, 300, PROG	1
10	107379	PCB ASSY, 68331, V-REG, PROG, 300	1
11	106817	TRANS ASSY, Y DRIVE, 24V	1
12	105933	PULLEY, 16T X .080 X 1/4	1
12	107346	PULLEY, 5MM BORE, 16T X .080 X 1/4	1
24	106665	KEYPAD ASSY, SC98	1
25	106708	TENSIONER ASSY, SC98	1
28	106713	TRAVERSE EXTRUSION, SC98, 30	1
31	106695	FERRITE, SPLIT, 100MHZ, .74IDX1.6L	1
33	106815	PLATEN, APPLI-K 99	1
34	106818	PLATE, END, RIGHT, APPLI-K 99	1
35	106819	PLATE, END, LEFT, APPLI-K 99	1
43	106903	SHAFT ASSY, APPLI-K 99	1
47	106717	COVER, BOTTOM, SC98, 30	1

System 300 Wrapping Procedure

106881

Wrapped Level



NOTES:

1. CUSHION CARRIAGE AT LEFT END OF PLOTTER WITH FOAM BLOCK (ITEM 11, NOT SHOWN), AND SECURE TO END OF PLOTTER WITH TYRAPS (ITEM 10, NOT SHOWN). SUPPORT CARRIAGE JAW WITH FOAM BLOCK (ITEM 11, NOT SHOWN).

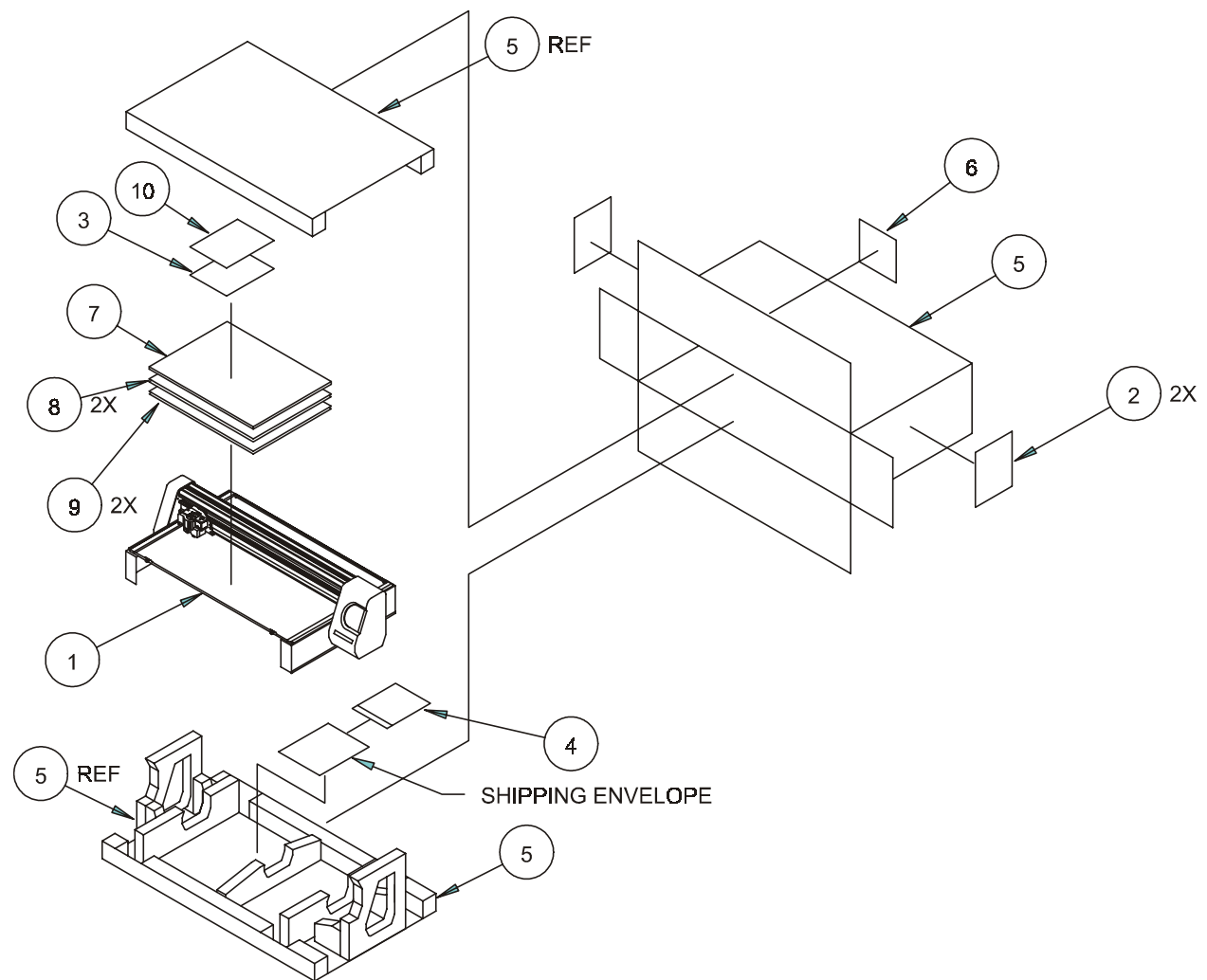
System 300 - Wrapping Procedure (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106882	CHASSIS, 300	1
2	106619	COVER, RIGHT END, SC98	1
3	106618	COVER, LEFT END, SC98	1
4	104926	STANDOFF, #8-32, 5.25 LG	2
5	104725	STANDOFF, #8-32, 1.75 LG	2
6	106241	WSHR, #8-32, .190 ID, .416 OD, .080THK	8
7	105762	LABEL, REAR PANEL, FCC/CE	1
8	106558	LABEL, FRONT, SC98	1
9	101581	SCREW #8-32, .375 FHP, BLACK	4
10	105921	TYRAP, 28" CABLETIE NAT. NYLON	1
11	101031	FOAM BLOCK, 2 IN X 2 IN X 2 IN	2
12	104008	SCREW #8-32, .375 LG, PHP SEMS	1
13	100044	SCREW #8-32, .75 PHP	4
14	104013	NUT, #8-32, KEP	4
15	107076	SHEET, ADHESIVE, HT, 18.5X30.5, 3PK	1
16	107086	MATERIAL, BACKING, 18X30, 1 SIDED	2
17	107088	MATERIAL, BACKING, 18X30, 2-SIDED	2

System 300 Boxing procedure

106880

FGI Level



System 300 - Boxing Procedure (Bill of Materials)

Drawing Number	Component Part Number	Component Description	Quantity Used
1	106881	WRAPPED, 300	1
2	107072	LABEL, SHIPPING BOX, 300	2
3	107073	PACKING LIST, 300	1
4	107074	KIT, ACCESSORY, 300	1
5	107079	BOX, SHIPPING, 300	1
6	107075	BOX LABEL, UNPACKING, 300 SYSTEM	2
7	107076	SHEET, ADHESIVE, HT, 18.5X30.5, 3PK	1
8	107086	MATERIAL, BACKING, 18X30, 1 SIDED	2
9	107088	MATERIAL, BACKING, 18X30, 2-SIDED	2
10	100278	TYRAP, .15 IN X 9 IN	4
10	107077	GUIDE, QUICK START, 200/300	1



Service Bulletins

Installation Error/301 Software

This bulletin pertains to versions 9-17 or higher of the Ioline 301 Software that do not install successfully.

Error Message: "could not install to C:\windows or c:\windows\system"

Error Message: "a required file, MSVBVM50.dll was not found".

1. Make sure that any virus-checking program (that might prevent writing to the Windows system area) is disabled.
2. Close all Windows application programs.
3. Using Windows Explorer, make sure that Windows is installed in the standard directory C:\windows\system. If not, note the Windows path for use in step 7.
4. If you have not already done so, copy the attached programs WSUP.EXE and WSUPE.EXE to a diskette. Use these diskettes for steps 5 and 6.
5. Place the disk with WSUP in drive A. Click on the Windows "Start" button, then click on "Run". Enter the following path into the "Open" field A:\WSUP. Click the Unzip button.
6. Place the disk with WSUPE in drive A. Click on the Windows "Start" button, then click on "Run". Enter the following path into the "Open" field A:\WSUPE.
7. If Windows was found in a nonstandard location, enter that location in the box when prompted "Unzip to Folder". If Windows is in the standard location, leave the entry I "Unzip to Folder" as is.
8. Click the Unzip button.
9. Reboot system.
10. Click on the 301-software icon. If any error messages are displayed, write them down and call Ioline Technical Support.



Creating Barudin Files/301 Software

Barudin files can be created in several different formats:

1. The Ioline Bridge/301 software reads Barudin .DAT files on DOS diskettes
2. If a customer can only create Barudin FMC diskettes, which are a CPM format disk, the customer must convert these by means of a conversion utility such as the one available from Sydex (541) 683-6033. It is called the "Barudin Only" version of "22 disks", and costs \$50.00. It runs on DOS not Windows and will read an FMC disk and create .DAT files on a DOS disk.
3. If a customer can only create Barudin FDR diskettes, there is no conversion path. The customer must replace his software with software that creates disks that are Barudin DOS, Tajima DOS, etc.

Run Time Error Codes/301 Software

Run-time error #5 – "Invalid Procedure Call"

Occurs only when the file name you are exporting exceeds 16 characters (prefix), and export in Tajima format. Other formats are not affected. To solve, rename the file to something less than 16 characters, then import into the design view of the 301 software and export in Tajima format as normal.

Run-time error #6 - "Overflow"

Occurs when a design is imported into the design view containing coordinates greater than 32,760. This is never a problem with designs appropriate for embroidery (rarely coordinates greater than 15,000). However, there are plot (.plt) designs that do contain larger coordinates (for sign cutters, etc.). This error should not occur when running 301 version 02-4 or higher on Win 95/98. However it will occur with Windows NT and 2000. Beta version 02-7 solves the problem (301CD8-1.exe and 301CD8-2.exe).

Run-time error #13 – "Type Mismatch"

Unknown circumstances.

Run-time error #57 – "Device I/O"

Involves Printer or Serial Port. Usually this error will be trapped within 301, but sometimes not.

Run-time error #75 – "Path/File Access Error"

File location or path does not exist.

".DLL Not Found" or "Procedure in .DLL Not Found"

Occurs if a .dll file was not properly installed. Verify Hardlock.vxd (Win95/98) Hardlock.sys (Windows NT), IolineLPT.dll and Tiffw32.dll exist in either C:\windows\system or C:\winnt\system folder.

Stitches Overlap to Wrong Side / 301 Software

Occurs most often when converting an 'outline' which is from an embroidery file (versus outlines generated from Corel Draw or the like). This is because the stitch segments are small and more irregular. Also, when a portion of the outline overlaps, the algorithm gets confused. Best results occur when there is no overlapping or doubling of outline segments.

How to "KISS-CUT"

Kiss cutting is the process of cutting through one layer of a stack of material and not cutting through the layer(s) below. Typically the upper layer(s) has a pressure sensitive backside which adheres to the lower layer of material.

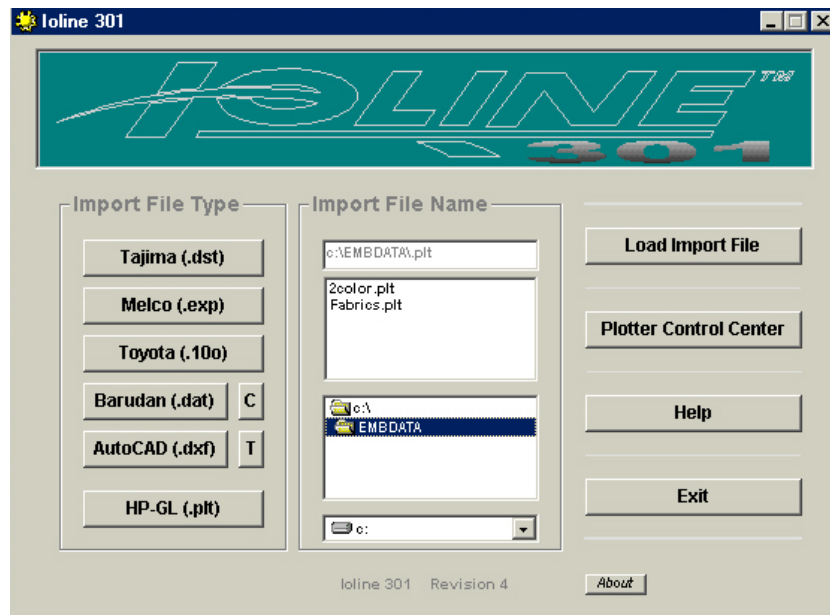
Kiss cutting creates more scrap material for the upper layer(s), (compared to cutting individual layers and hand placing them on the lower layers) but can result in a considerable time savings since multiple layers do not need to be aligned and the placement stitch for the upper layer may be eliminated from the embroidery process.

1. Place Background material onto adhesive sheet and smooth it flat. Place the foreground material on top of the background material making sure the sticky side is down.
2. Load Blade Holder into Carriage Jaw.
3. Adjust Blade Holder as described in the quick start guide. (Test with single button test cut.) Adjust blade exposure and cutting force so that only the material is cut. Adhesive sheet may be scored lightly.

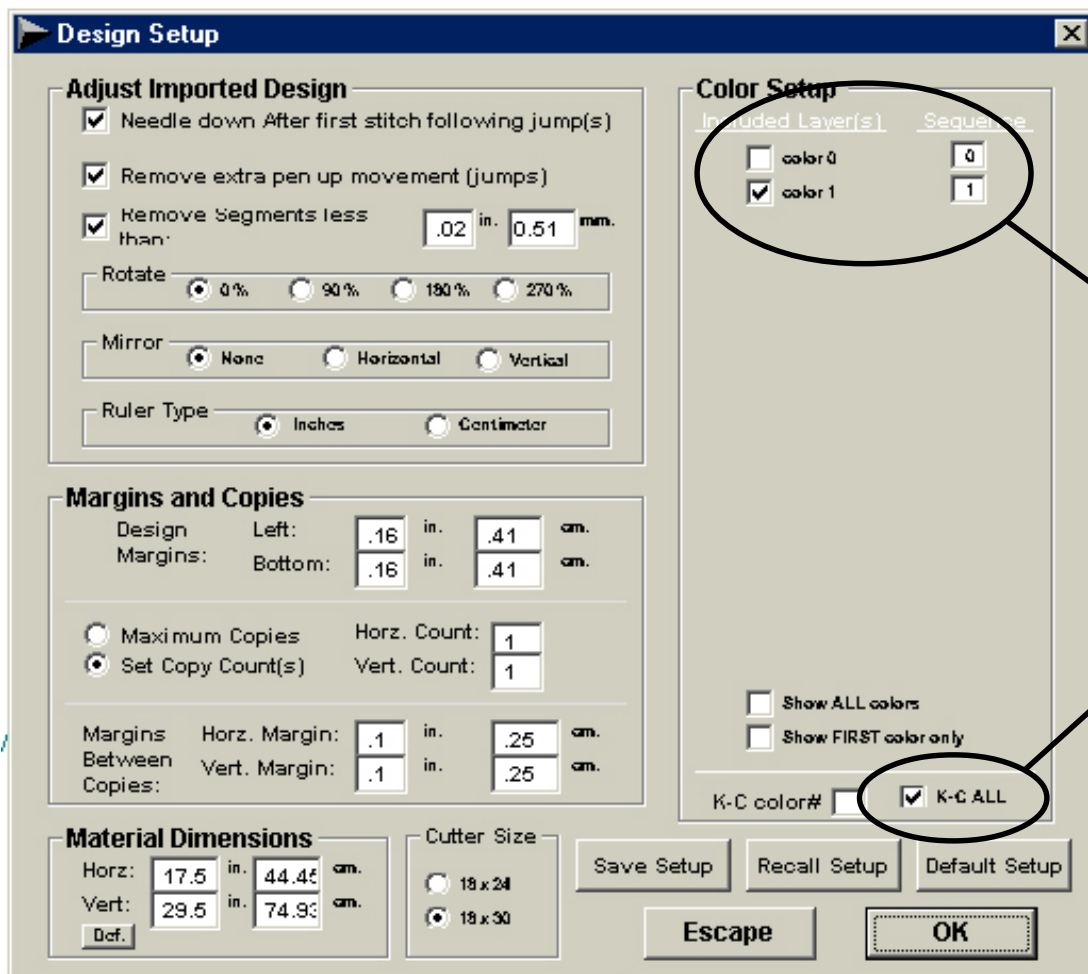
Note: It is recommended that the materials are of similar type and thickness so the blade does not need readjustment.

4. Once blade is adjusted, use the Keypad Arrow keys to position the Table and Carriage so that the Blade Holder is over the lower right corner of the material (lower left origin of plot file).
5. Press Set Origin on the Keypad to obtain a green Keypad light.
6. Open the 301 software.
7. Select the directory and file you wish to open (See "301 Main Window" on the next page). Double click on the file or select the file and click on Load Import File.
8. Select Design Setup.
9. Under the Color Setup heading, select K-C ALL (Kiss Cut All). (See "Design Setup" window on the next page)
10. Under the Color Setup heading, select the color that corresponds to the "Top" layer of the design to be cut. This should be the profile with the Smallest perimeter. (See "Design setup" window on the next page)
11. Select OK.
12. Select Send to Cutter.
13. Select OK.
14. When the first cut is done, press the Start/Stop button (the light should turn "Red") and move the tray forward. Weed away the excess material around the top letter.
15. Press Start/Stop button on the cutters keypad, the light should turn back to green, and the tray and head will move back to the original starting point.
16. Under the Color Setup heading, select the color that corresponds to the next layer of the design to be cut and deselect the color that was just cut. This profile should have a larger perimeter than the one previously cut.
17. Select OK.
18. Select Send to Cutter.
19. After it has finished cutting, weed away the excess material.

Note: As an alternative method, you can also cut the pieces in reverse order. For example, cut out the background piece(s) first, then lay the top piece of fabric on and cut those pieces out. This method allows you to cut a whole tray of Kiss-Cuts, and weed the two pieces of fabric together.



301 "Main" Window



Ioline 301 "Design Setup" Window